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Chapter 5

Module Documentation

5.1 Export Definitions

Macros

- #define YAML_DECLARE(type) type

5.1.1 Detailed Description

5.1.2 Macro Definition Documentation

5.1.2.1 #define YAML_DECLARE(*type*) type

The public API declaration.

5.2 Version Information

Functions

- yaml_get_version_string (void)
- yaml_get_version (int *major, int *minor, int *patch)

5.2.1 Detailed Description

5.2.2 Function Documentation

5.2.2.1 yaml_get_version (int * *major*, int * *minor*, int * *patch*)

Get the library version numbers.

Parameters

out	*major*	Major version number.
out	*minor*	Minor version number.
out	*patch*	Patch version number.

5.2.2.2 yaml_get_version_string (void)

Get the library version as a string.

Returns

The function returns the pointer to a static string of the form `"X.Y.Z"`, where `X` is the major version number, `Y` is a minor version number, and `Z` is the patch version number.

5.3 Basic Types

Classes

- struct yaml_version_directive_s
- struct yaml_tag_directive_s
- struct yaml_mark_s

Typedefs

- typedef unsigned char yaml_char_t
- typedef struct yaml_version_directive_s yaml_version_directive_t
- typedef struct yaml_tag_directive_s yaml_tag_directive_t
- typedef enum yaml_encoding_e yaml_encoding_t
- typedef enum yaml_break_e yaml_break_t
- typedef enum yaml_error_type_e yaml_error_type_t
- typedef struct yaml_mark_s yaml_mark_t

Enumerations

- enum yaml_encoding_e { YAML_ANY_ENCODING, YAML_UTF8_ENCODING, YAML_UTF16LE_ENCODING, YAML_UTF16BE_ENCODING }
- enum yaml_break_e { YAML_ANY_BREAK, YAML_CR_BREAK, YAML_LN_BREAK, YAML_CRLN_BREAK }
- enum yaml_error_type_e { YAML_NO_ERROR, YAML_MEMORY_ERROR, YAML_READER_ERROR, YAML_SCANNER_ERROR, YAML_PARSER_ERROR, YAML_COMPOSER_ERROR, YAML_WRITER_ERROR, YAML_EMITTER_ERROR }

5.3.1 Detailed Description

5.3.2 Typedef Documentation

5.3.2.1 typedef enum yaml_break_e yaml_break_t

Line break types.

5.3.2.2 typedef unsigned char yaml_char_t

The character type (UTF-8 octet).

5.3.2.3 typedef enum yaml_encoding_e yaml_encoding_t

The stream encoding.

5.3.2.4 typedef enum yaml_error_type_e yaml_error_type_t

Many bad things could happen with the parser and emitter.

5.3.2.5 typedef struct yaml_mark_s yaml_mark_t

The pointer position.

5.3.2.6 typedef struct yaml_tag_directive_s yaml_tag_directive_t

The tag directive data.

5.3.2.7 typedef struct yaml_version_directive_s yaml_version_directive_t

The version directive data.

5.3.3 Enumeration Type Documentation

5.3.3.1 enum yaml_break_e

Line break types.

Enumerator

YAML_ANY_BREAK Let the parser choose the break type.

YAML_CR_BREAK Use CR for line breaks (Mac style).

YAML_LN_BREAK Use LN for line breaks (Unix style).

YAML_CRLN_BREAK Use CR LN for line breaks (DOS style).

5.3.3.2 enum yaml_encoding_e

The stream encoding.

Enumerator

YAML_ANY_ENCODING Let the parser choose the encoding.

YAML_UTF8_ENCODING The default UTF-8 encoding.

YAML_UTF16LE_ENCODING The UTF-16-LE encoding with BOM.

YAML_UTF16BE_ENCODING The UTF-16-BE encoding with BOM.

5.3.3.3 enum yaml_error_type_e

Many bad things could happen with the parser and emitter.

Enumerator

YAML_NO_ERROR No error is produced.

YAML_MEMORY_ERROR Cannot allocate or reallocate a block of memory.

YAML_READER_ERROR Cannot read or decode the input stream.

YAML_SCANNER_ERROR Cannot scan the input stream.

YAML_PARSER_ERROR Cannot parse the input stream.

YAML_COMPOSER_ERROR Cannot compose a YAML document.

YAML_WRITER_ERROR Cannot write to the output stream.

YAML_EMITTER_ERROR Cannot emit a YAML stream.

5.4 Node Styles

Typedefs

- typedef enum yaml_scalar_style_e yaml_scalar_style_t
- typedef enum yaml_sequence_style_e yaml_sequence_style_t
- typedef enum yaml_mapping_style_e yaml_mapping_style_t

Enumerations

- enum yaml_scalar_style_e {
  YAML_ANY_SCALAR_STYLE, YAML_PLAIN_SCALAR_STYLE, YAML_SINGLE_QUOTED_SCALAR_STYLE, YAML_DOUBLE_QUOTED_SCALAR_STYLE,
  YAML_LITERAL_SCALAR_STYLE, YAML_FOLDED_SCALAR_STYLE }
- enum yaml_sequence_style_e { YAML_ANY_SEQUENCE_STYLE, YAML_BLOCK_SEQUENCE_STYLE, YAML_FLOW_SEQUENCE_STYLE }
- enum yaml_mapping_style_e { YAML_ANY_MAPPING_STYLE, YAML_BLOCK_MAPPING_STYLE, YAML_FLOW_MAPPING_STYLE }

5.4.1 Detailed Description

5.4.2 Typedef Documentation

5.4.2.1 typedef enum yaml_mapping_style_e yaml_mapping_style_t

Mapping styles.

5.4.2.2 typedef enum yaml_scalar_style_e yaml_scalar_style_t

Scalar styles.

5.4.2.3 typedef enum yaml_sequence_style_e yaml_sequence_style_t

Sequence styles.

5.4.3 Enumeration Type Documentation

5.4.3.1 enum yaml_mapping_style_e

Mapping styles.

Enumerator

YAML_ANY_MAPPING_STYLE Let the emitter choose the style.

YAML_BLOCK_MAPPING_STYLE The block mapping style.

YAML_FLOW_MAPPING_STYLE The flow mapping style.

5.4.3.2 enum yaml_scalar_style_e

Scalar styles.

Enumerator

YAML_ANY_SCALAR_STYLE Let the emitter choose the style.

YAML_PLAIN_SCALAR_STYLE The plain scalar style.

YAML_SINGLE_QUOTED_SCALAR_STYLE The single-quoted scalar style.

YAML_DOUBLE_QUOTED_SCALAR_STYLE The double-quoted scalar style.

YAML_LITERAL_SCALAR_STYLE The literal scalar style.

YAML_FOLDED_SCALAR_STYLE The folded scalar style.

5.4.3.3 enum yaml_sequence_style_e

Sequence styles.

Enumerator

YAML_ANY_SEQUENCE_STYLE Let the emitter choose the style.

YAML_BLOCK_SEQUENCE_STYLE The block sequence style.

YAML_FLOW_SEQUENCE_STYLE The flow sequence style.

5.5 Tokens

Classes

- struct yaml_token_s

Typedefs

- typedef enum yaml_token_type_e yaml_token_type_t
- typedef struct yaml_token_s yaml_token_t

Enumerations

- enum yaml_token_type_e {
  YAML_NO_TOKEN, YAML_STREAM_START_TOKEN, YAML_STREAM_END_TOKEN, YAML_VERSION-
  _DIRECTIVE_TOKEN,
  YAML_TAG_DIRECTIVE_TOKEN, YAML_DOCUMENT_START_TOKEN, YAML_DOCUMENT_END_TOK-
  EN, YAML_BLOCK_SEQUENCE_START_TOKEN,
  YAML_BLOCK_MAPPING_START_TOKEN, YAML_BLOCK_END_TOKEN, YAML_FLOW_SEQUENCE_-
  START_TOKEN, YAML_FLOW_SEQUENCE_END_TOKEN,
  YAML_FLOW_MAPPING_START_TOKEN, YAML_FLOW_MAPPING_END_TOKEN, YAML_BLOCK_ENT-
  RY_TOKEN, YAML_FLOW_ENTRY_TOKEN,
  YAML_KEY_TOKEN, YAML_VALUE_TOKEN, YAML_ALIAS_TOKEN, YAML_ANCHOR_TOKEN,
  YAML_TAG_TOKEN, YAML_SCALAR_TOKEN }

Functions

- yaml_token_delete (yaml_token_t ∗token)

5.5.1 Detailed Description

5.5.2 Typedef Documentation

5.5.2.1 typedef struct yaml_token_s yaml_token_t

The token structure.

5.5.2.2 typedef enum yaml_token_type_e yaml_token_type_t

Token types.

5.5.3 Enumeration Type Documentation

5.5.3.1 enum yaml_token_type_e

Token types.

Enumerator

YAML_NO_TOKEN An empty token.

YAML_STREAM_START_TOKEN A STREAM-START token.

YAML_STREAM_END_TOKEN A STREAM-END token.

YAML_VERSION_DIRECTIVE_TOKEN A VERSION-DIRECTIVE token.

YAML_TAG_DIRECTIVE_TOKEN A TAG-DIRECTIVE token.

YAML_DOCUMENT_START_TOKEN A DOCUMENT-START token.

YAML_DOCUMENT_END_TOKEN A DOCUMENT-END token.

YAML_BLOCK_SEQUENCE_START_TOKEN A BLOCK-SEQUENCE-START token.

YAML_BLOCK_MAPPING_START_TOKEN A BLOCK-SEQUENCE-END token.

YAML_BLOCK_END_TOKEN A BLOCK-END token.

YAML_FLOW_SEQUENCE_START_TOKEN A FLOW-SEQUENCE-START token.

YAML_FLOW_SEQUENCE_END_TOKEN A FLOW-SEQUENCE-END token.

YAML_FLOW_MAPPING_START_TOKEN A FLOW-MAPPING-START token.

YAML_FLOW_MAPPING_END_TOKEN A FLOW-MAPPING-END token.

YAML_BLOCK_ENTRY_TOKEN A BLOCK-ENTRY token.

YAML_FLOW_ENTRY_TOKEN A FLOW-ENTRY token.

YAML_KEY_TOKEN A KEY token.

YAML_VALUE_TOKEN A VALUE token.

YAML_ALIAS_TOKEN An ALIAS token.

YAML_ANCHOR_TOKEN An ANCHOR token.

YAML_TAG_TOKEN A TAG token.

YAML_SCALAR_TOKEN A SCALAR token.

5.5.4 Function Documentation

5.5.4.1 yaml_token_delete (**yaml_token_t** * *token*)

Free any memory allocated for a token object.

Parameters

in,out	*token*	A token object.

5.6 Events

Classes

- struct yaml_event_s

Typedefs

- typedef enum yaml_event_type_e yaml_event_type_t
- typedef struct yaml_event_s yaml_event_t

Enumerations

- enum yaml_event_type_e {
  YAML_NO_EVENT, YAML_STREAM_START_EVENT, YAML_STREAM_END_EVENT, YAML_DOCUMENT_START_EVENT,
  YAML_DOCUMENT_END_EVENT, YAML_ALIAS_EVENT, YAML_SCALAR_EVENT, YAML_SEQUENCE_START_EVENT,
  YAML_SEQUENCE_END_EVENT, YAML_MAPPING_START_EVENT, YAML_MAPPING_END_EVENT }

Functions

- yaml_stream_start_event_initialize (yaml_event_t *event, yaml_encoding_t encoding)
- yaml_stream_end_event_initialize (yaml_event_t *event)
- yaml_document_start_event_initialize (yaml_event_t *event, yaml_version_directive_t *version_directive, yaml_tag_directive_t *tag_directives_start, yaml_tag_directive_t *tag_directives_end, int implicit)
- yaml_document_end_event_initialize (yaml_event_t *event, int implicit)
- yaml_alias_event_initialize (yaml_event_t *event, yaml_char_t *anchor)
- yaml_scalar_event_initialize (yaml_event_t *event, yaml_char_t *anchor, yaml_char_t *tag, yaml_char_t *value, int length, int plain_implicit, int quoted_implicit, yaml_scalar_style_t style)
- yaml_sequence_start_event_initialize (yaml_event_t *event, yaml_char_t *anchor, yaml_char_t *tag, int implicit, yaml_sequence_style_t style)
- yaml_sequence_end_event_initialize (yaml_event_t *event)
- yaml_mapping_start_event_initialize (yaml_event_t *event, yaml_char_t *anchor, yaml_char_t *tag, int implicit, yaml_mapping_style_t style)
- yaml_mapping_end_event_initialize (yaml_event_t *event)
- yaml_event_delete (yaml_event_t *event)

5.6.1 Detailed Description

5.6.2 Typedef Documentation

5.6.2.1 typedef struct yaml_event_s yaml_event_t

The event structure.

5.6.2.2 typedef enum yaml_event_type_e yaml_event_type_t

Event types.

5.6.3 Enumeration Type Documentation

5.6.3.1 enum yaml_event_type_e

Event types.

Enumerator

YAML_NO_EVENT An empty event.

YAML_STREAM_START_EVENT A STREAM-START event.

YAML_STREAM_END_EVENT A STREAM-END event.

YAML_DOCUMENT_START_EVENT A DOCUMENT-START event.

YAML_DOCUMENT_END_EVENT A DOCUMENT-END event.

YAML_ALIAS_EVENT An ALIAS event.

YAML_SCALAR_EVENT A SCALAR event.

YAML_SEQUENCE_START_EVENT A SEQUENCE-START event.

YAML_SEQUENCE_END_EVENT A SEQUENCE-END event.

YAML_MAPPING_START_EVENT A MAPPING-START event.

YAML_MAPPING_END_EVENT A MAPPING-END event.

5.6.4 Function Documentation

5.6.4.1 yaml_alias_event_initialize (yaml_event_t * *event*, yaml_char_t * *anchor*)

Create an ALIAS event.

Parameters

out	*event*	An empty event object.
in	*anchor*	The anchor value.

Returns

`1` if the function succeeded, `0` on error.

5.6.4.2 yaml_document_end_event_initialize (yaml_event_t * *event*, int *implicit*)

Create the DOCUMENT-END event.

The *implicit* argument is considered as a stylistic parameter and may be ignored by the emitter.

Parameters

out	*event*	An empty event object.
in	*implicit*	If the document end indicator is implicit.

Returns

`1` if the function succeeded, `0` on error.

5.6.4.3 yaml_document_start_event_initialize (yaml_event_t * *event*, yaml_version_directive_t * *version_directive*, yaml_tag_directive_t * *tag_directives_start*, yaml_tag_directive_t * *tag_directives_end*, int *implicit*)

Create the DOCUMENT-START event.

The *implicit* argument is considered as a stylistic parameter and may be ignored by the emitter.

Parameters

`out`	*event*	An empty event object.
`in`	*version_directive*	The YAML directive value or `NULL`.
`in`	*tag_directives_start*	The beginning of the TAG directives list.
`in`	*tag_directives_end*	The end of the TAG directives list.
`in`	*implicit*	If the document start indicator is implicit.

Returns

`1` if the function succeeded, `0` on error.

5.6.4.4 yaml_event_delete (yaml_event_t * *event*)

Free any memory allocated for an event object.

Parameters

`in,out`	*event*	An event object.

5.6.4.5 yaml_mapping_end_event_initialize (yaml_event_t * *event*)

Create a MAPPING-END event.

Parameters

`out`	*event*	An empty event object.

Returns

`1` if the function succeeded, `0` on error.

5.6.4.6 yaml_mapping_start_event_initialize (yaml_event_t * *event*, yaml_char_t * *anchor*, yaml_char_t * *tag*, int *implicit*, yaml_mapping_style_t *style*)

Create a MAPPING-START event.

The *style* argument may be ignored by the emitter.

Either the *tag* attribute or the *implicit* flag must be set.

Parameters

out	*event*	An empty event object.
in	*anchor*	The mapping anchor or NULL.
in	*tag*	The mapping tag or NULL.
in	*implicit*	If the tag may be omitted.
in	*style*	The mapping style.

Returns

1 if the function succeeded, 0 on error.

5.6.4.7 yaml_scalar_event_initialize (yaml_event_t * *event*, yaml_char_t * *anchor*, yaml_char_t * *tag*, yaml_char_t * *value*, int *length*, int *plain_implicit*, int *quoted_implicit*, yaml_scalar_style_t *style*)

Create a SCALAR event.

The *style* argument may be ignored by the emitter.

Either the *tag* attribute or one of the *plain_implicit* and *quoted_implicit* flags must be set.

Parameters

out	*event*	An empty event object.
in	*anchor*	The scalar anchor or NULL.
in	*tag*	The scalar tag or NULL.
in	*value*	The scalar value.
in	*length*	The length of the scalar value.
in	*plain_implicit*	If the tag may be omitted for the plain style.
in	*quoted_implicit*	If the tag may be omitted for any non-plain style.
in	*style*	The scalar style.

Returns

1 if the function succeeded, 0 on error.

5.6.4.8 yaml_sequence_end_event_initialize (yaml_event_t * *event*)

Create a SEQUENCE-END event.

Parameters

out	*event*	An empty event object.

Returns

1 if the function succeeded, 0 on error.

5.6.4.9 yaml_sequence_start_event_initialize (yaml_event_t * *event*, yaml_char_t * *anchor*, yaml_char_t * *tag*, int *implicit*, yaml_sequence_style_t *style*)

Create a SEQUENCE-START event.

The *style* argument may be ignored by the emitter.

Either the *tag* attribute or the *implicit* flag must be set.

Parameters

out	*event*	An empty event object.
in	*anchor*	The sequence anchor or NULL.
in	*tag*	The sequence tag or NULL.
in	*implicit*	If the tag may be omitted.
in	*style*	The sequence style.

Returns

1 if the function succeeded, 0 on error.

5.6.4.10 yaml_stream_end_event_initialize (yaml_event_t * *event*)

Create the STREAM-END event.

Parameters

out	*event*	An empty event object.

Returns

1 if the function succeeded, 0 on error.

5.6.4.11 yaml_stream_start_event_initialize (yaml_event_t * *event*, yaml_encoding_t *encoding*)

Create the STREAM-START event.

Parameters

out	*event*	An empty event object.
in	*encoding*	The stream encoding.

Returns

1 if the function succeeded, 0 on error.

5.7 Nodes

Classes

- struct yaml_node_pair_s
- struct yaml_node_s
- struct yaml_document_s

Macros

- #define YAML_NULL_TAG "tag:yaml.org,2002:null"
- #define YAML_BOOL_TAG "tag:yaml.org,2002:bool"
- #define YAML_STR_TAG "tag:yaml.org,2002:str"
- #define YAML_INT_TAG "tag:yaml.org,2002:int"
- #define YAML_FLOAT_TAG "tag:yaml.org,2002:float"
- #define YAML_TIMESTAMP_TAG "tag:yaml.org,2002:timestamp"
- #define YAML_SEQ_TAG "tag:yaml.org,2002:seq"
- #define YAML_MAP_TAG "tag:yaml.org,2002:map"
- #define YAML_DEFAULT_SCALAR_TAG YAML_STR_TAG
- #define YAML_DEFAULT_SEQUENCE_TAG YAML_SEQ_TAG
- #define YAML_DEFAULT_MAPPING_TAG YAML_MAP_TAG

Typedefs

- typedef enum yaml_node_type_e yaml_node_type_t
- typedef struct yaml_node_s yaml_node_t
- typedef int yaml_node_item_t
- typedef struct yaml_node_pair_s yaml_node_pair_t
- typedef struct yaml_document_s yaml_document_t

Enumerations

- enum yaml_node_type_e { YAML_NO_NODE, YAML_SCALAR_NODE, YAML_SEQUENCE_NODE, YAML_MAPPING_NODE }

Functions

- yaml_document_initialize (yaml_document_t *document, yaml_version_directive_t *version_directive, yaml_tag_directive_t *tag_directives_start, yaml_tag_directive_t *tag_directives_end, int start_implicit, int end_implicit)
- yaml_document_delete (yaml_document_t *document)
- yaml_document_get_node (yaml_document_t *document, int index)
- yaml_document_get_root_node (yaml_document_t *document)
- yaml_document_add_scalar (yaml_document_t *document, yaml_char_t *tag, yaml_char_t *value, int length, yaml_scalar_style_t style)
- yaml_document_add_sequence (yaml_document_t *document, yaml_char_t *tag, yaml_sequence_style_t style)
- yaml_document_add_mapping (yaml_document_t *document, yaml_char_t *tag, yaml_mapping_style_t style)
- yaml_document_append_sequence_item (yaml_document_t *document, int sequence, int item)
- yaml_document_append_mapping_pair (yaml_document_t *document, int mapping, int key, int value)

5.7.1 Detailed Description

5.7.2 Macro Definition Documentation

5.7.2.1 #define YAML_BOOL_TAG "tag:yaml.org,2002:bool"

The tag `!!bool` with the values: `true` and `falce`.

5.7.2.2 #define YAML_DEFAULT_MAPPING_TAG YAML_MAP_TAG

The default mapping tag is `!!map`.

5.7.2.3 #define YAML_DEFAULT_SCALAR_TAG YAML_STR_TAG

The default scalar tag is `!!str`.

5.7.2.4 #define YAML_DEFAULT_SEQUENCE_TAG YAML_SEQ_TAG

The default sequence tag is `!!seq`.

5.7.2.5 #define YAML_FLOAT_TAG "tag:yaml.org,2002:float"

The tag `!!float` for float values.

5.7.2.6 #define YAML_INT_TAG "tag:yaml.org,2002:int"

The tag `!!int` for integer values.

5.7.2.7 #define YAML_MAP_TAG "tag:yaml.org,2002:map"

The tag `!!map` is used to denote mapping.

5.7.2.8 #define YAML_NULL_TAG "tag:yaml.org,2002:null"

The tag `!!null` with the only possible value: `null`.

5.7.2.9 #define YAML_SEQ_TAG "tag:yaml.org,2002:seq"

The tag `!!seq` is used to denote sequences.

5.7.2.10 #define YAML_STR_TAG "tag:yaml.org,2002:str"

The tag `!!str` for string values.

5.7.2.11 #define YAML_TIMESTAMP_TAG "tag:yaml.org,2002:timestamp"

The tag `!!timestamp` for date and time values.

5.7.3 Typedef Documentation

5.7.3.1 typedef struct yaml_document_s yaml_document_t

The document structure.

5.7.3.2 typedef int yaml_node_item_t

An element of a sequence node.

5.7.3.3 typedef struct yaml_node_pair_s yaml_node_pair_t

An element of a mapping node.

5.7.3.4 typedef struct yaml_node_s yaml_node_t

The forward definition of a document node structure.

5.7.3.5 typedef enum yaml_node_type_e yaml_node_type_t

Node types.

5.7.4 Enumeration Type Documentation

5.7.4.1 enum yaml_node_type_e

Node types.

Enumerator

YAML_NO_NODE An empty node.

YAML_SCALAR_NODE A scalar node.

YAML_SEQUENCE_NODE A sequence node.

YAML_MAPPING_NODE A mapping node.

5.7.5 Function Documentation

5.7.5.1 yaml_document_add_mapping (yaml_document_t * *document*, yaml_char_t * *tag*, yaml_mapping_style_t *style*)

Create a MAPPING node and attach it to the document.

The *style* argument may be ignored by the emitter.

Parameters

in,out	*document*	A document object.
in	*tag*	The sequence tag.
in	*style*	The sequence style.

Returns

the node id or 0 on error.

5.7.5.2 yaml_document_add_scalar (yaml_document_t * *document*, yaml_char_t * *tag*, yaml_char_t * *value*, int *length*, yaml_scalar_style_t *style*)

Create a SCALAR node and attach it to the document.

The *style* argument may be ignored by the emitter.

Parameters

in,out	*document*	A document object.
in	*tag*	The scalar tag.
in	*value*	The scalar value.
in	*length*	The length of the scalar value.
in	*style*	The scalar style.

Returns

the node id or 0 on error.

5.7.5.3 yaml_document_add_sequence (yaml_document_t * *document*, yaml_char_t * *tag*, yaml_sequence_style_t *style*)

Create a SEQUENCE node and attach it to the document.

The *style* argument may be ignored by the emitter.

Parameters

in,out	*document*	A document object.
in	*tag*	The sequence tag.
in	*style*	The sequence style.

Returns

the node id or 0 on error.

5.7.5.4 yaml_document_append_mapping_pair (yaml_document_t * *document*, int *mapping*, int *key*, int *value*)

Add a pair of a key and a value to a MAPPING node.

Parameters

in,out	*document*	A document object.
in	*mapping*	The mapping node id.
in	*key*	The key node id.
in	*value*	The value node id.

Returns

1 if the function succeeded, 0 on error.

5.7.5.5 yaml_document_append_sequence_item (yaml_document_t * *document*, int *sequence*, int *item*)

Add an item to a SEQUENCE node.

Parameters

in,out	*document*	A document object.
in	*sequence*	The sequence node id.
in	*item*	The item node id.

Returns

`1` if the function succeeded, `0` on error.

5.7.5.6 yaml_document_delete (yaml_document_t * *document*)

Delete a YAML document and all its nodes.

Parameters

in,out	*document*	A document object.

5.7.5.7 yaml_document_get_node (yaml_document_t * *document*, int *index*)

Get a node of a YAML document.

The pointer returned by this function is valid until any of the functions modifying the documents are called.

Parameters

in	*document*	A document object.
in	*index*	The node id.

Returns

the node objct or `NULL` if `node_id` is out of range.

Get a document node.

5.7.5.8 yaml_document_get_root_node (yaml_document_t * *document*)

Get the root of a YAML document node.

The root object is the first object added to the document.

The pointer returned by this function is valid until any of the functions modifying the documents are called.

An empty document produced by the parser signifies the end of a YAML stream.

Parameters

in	*document*	A document object.

Returns

the node object or `NULL` if the document is empty.

Get the root object.

5.7.5.9 yaml_document_initialize (yaml_document_t * *document*, yaml_version_directive_t * *version_directive*, yaml_tag_directive_t * *tag_directives_start*, yaml_tag_directive_t * *tag_directives_end*, int *start_implicit*, int *end_implicit*)

Create a YAML document.

Parameters

out	*document*	An empty document object.
in	*version_directive*	The YAML directive value or NULL.
in	*tag_directives_start*	The beginning of the TAG directives list.
in	*tag_directives_end*	The end of the TAG directives list.
in	*start_implicit*	If the document start indicator is implicit.
in	*end_implicit*	If the document end indicator is implicit.

Returns

1 if the function succeeded, 0 on error.

5.8 Parser Definitions

Classes

- struct yaml_simple_key_s
- struct yaml_alias_data_s
- struct yaml_parser_s

Typedefs

- typedef int yaml_read_handler_t (void *data, unsigned char *buffer, size_t size, size_t *size_read)
- typedef struct yaml_simple_key_s yaml_simple_key_t
- typedef enum yaml_parser_state_e yaml_parser_state_t
- typedef struct yaml_alias_data_s yaml_alias_data_t
- typedef struct yaml_parser_s yaml_parser_t

Enumerations

- enum yaml_parser_state_e {
  YAML_PARSE_STREAM_START_STATE, YAML_PARSE_IMPLICIT_DOCUMENT_START_STATE, YAML_PARSE_DOCUMENT_START_STATE, YAML_PARSE_DOCUMENT_CONTENT_STATE,
  YAML_PARSE_DOCUMENT_END_STATE, YAML_PARSE_BLOCK_NODE_STATE, YAML_PARSE_BLOCK_NODE_OR_INDENTLESS_SEQUENCE_STATE, YAML_PARSE_FLOW_NODE_STATE,
  YAML_PARSE_BLOCK_SEQUENCE_FIRST_ENTRY_STATE, YAML_PARSE_BLOCK_SEQUENCE_ENTRY_STATE, YAML_PARSE_INDENTLESS_SEQUENCE_ENTRY_STATE, YAML_PARSE_BLOCK_MAPPING_FIRST_KEY_STATE,
  YAML_PARSE_BLOCK_MAPPING_KEY_STATE, YAML_PARSE_BLOCK_MAPPING_VALUE_STATE, YAML_PARSE_FLOW_SEQUENCE_FIRST_ENTRY_STATE, YAML_PARSE_FLOW_SEQUENCE_ENTRY_STATE,
  YAML_PARSE_FLOW_SEQUENCE_ENTRY_MAPPING_KEY_STATE, YAML_PARSE_FLOW_SEQUENCE_ENTRY_MAPPING_VALUE_STATE, YAML_PARSE_FLOW_SEQUENCE_ENTRY_MAPPING_END_STATE, YAML_PARSE_FLOW_MAPPING_FIRST_KEY_STATE,
  YAML_PARSE_FLOW_MAPPING_KEY_STATE, YAML_PARSE_FLOW_MAPPING_VALUE_STATE, YAML_PARSE_FLOW_MAPPING_EMPTY_VALUE_STATE, YAML_PARSE_END_STATE }

Functions

- yaml_parser_initialize (yaml_parser_t *parser)
- yaml_parser_delete (yaml_parser_t *parser)
- yaml_parser_set_input_string (yaml_parser_t *parser, const unsigned char *input, size_t size)
- yaml_parser_set_input_file (yaml_parser_t *parser, FILE *file)
- yaml_parser_set_input (yaml_parser_t *parser, yaml_read_handler_t *handler, void *data)
- yaml_parser_set_encoding (yaml_parser_t *parser, yaml_encoding_t encoding)
- yaml_parser_scan (yaml_parser_t *parser, yaml_token_t *token)
- yaml_parser_parse (yaml_parser_t *parser, yaml_event_t *event)
- yaml_parser_load (yaml_parser_t *parser, yaml_document_t *document)

5.8.1 Detailed Description

5.8.2 Typedef Documentation

5.8.2.1 typedef struct yaml_alias_data_s yaml_alias_data_t

This structure holds aliases data.

5.8.2.2 typedef enum yaml_parser_state_e yaml_parser_state_t

The states of the parser.

5.8.2.3 typedef struct yaml_parser_s yaml_parser_t

The parser structure.

All members are internal. Manage the structure using the `yaml_parser_` family of functions.

5.8.2.4 typedef int yaml_read_handler_t(void *data, unsigned char *buffer, size_t size, size_t *size_read)

The prototype of a read handler.

The read handler is called when the parser needs to read more bytes from the source. The handler should write not more than *size* bytes to the *buffer*. The number of written bytes should be set to the *length* variable.

Parameters

`in,out`	*data*	A pointer to an application data specified by yaml_parser_set_input().
`out`	*buffer*	The buffer to write the data from the source.
`in`	*size*	The size of the buffer.
`out`	*size_read*	The actual number of bytes read from the source.

Returns

On success, the handler should return `1`. If the handler failed, the returned value should be `0`. On EOF, the handler should set the *size_read* to `0` and return `1`.

5.8.2.5 typedef struct yaml_simple_key_s yaml_simple_key_t

This structure holds information about a potential simple key.

5.8.3 Enumeration Type Documentation

5.8.3.1 enum yaml_parser_state_e

The states of the parser.

Enumerator

YAML_PARSE_STREAM_START_STATE Expect STREAM-START.

YAML_PARSE_IMPLICIT_DOCUMENT_START_STATE Expect the beginning of an implicit document.

YAML_PARSE_DOCUMENT_START_STATE Expect DOCUMENT-START.

YAML_PARSE_DOCUMENT_CONTENT_STATE Expect the content of a document.

YAML_PARSE_DOCUMENT_END_STATE Expect DOCUMENT-END.

YAML_PARSE_BLOCK_NODE_STATE Expect a block node.

YAML_PARSE_BLOCK_NODE_OR_INDENTLESS_SEQUENCE_STATE Expect a block node or indentless sequence.

YAML_PARSE_FLOW_NODE_STATE Expect a flow node.

YAML_PARSE_BLOCK_SEQUENCE_FIRST_ENTRY_STATE Expect the first entry of a block sequence.

YAML_PARSE_BLOCK_SEQUENCE_ENTRY_STATE Expect an entry of a block sequence.

YAML_PARSE_INDENTLESS_SEQUENCE_ENTRY_STATE Expect an entry of an indentless sequence.

YAML_PARSE_BLOCK_MAPPING_FIRST_KEY_STATE Expect the first key of a block mapping.

YAML_PARSE_BLOCK_MAPPING_KEY_STATE Expect a block mapping key.

YAML_PARSE_BLOCK_MAPPING_VALUE_STATE Expect a block mapping value.

YAML_PARSE_FLOW_SEQUENCE_FIRST_ENTRY_STATE Expect the first entry of a flow sequence.

YAML_PARSE_FLOW_SEQUENCE_ENTRY_STATE Expect an entry of a flow sequence.

YAML_PARSE_FLOW_SEQUENCE_ENTRY_MAPPING_KEY_STATE Expect a key of an ordered mapping.

YAML_PARSE_FLOW_SEQUENCE_ENTRY_MAPPING_VALUE_STATE Expect a value of an ordered mapping.

YAML_PARSE_FLOW_SEQUENCE_ENTRY_MAPPING_END_STATE Expect the and of an ordered mapping entry.

YAML_PARSE_FLOW_MAPPING_FIRST_KEY_STATE Expect the first key of a flow mapping.

YAML_PARSE_FLOW_MAPPING_KEY_STATE Expect a key of a flow mapping.

YAML_PARSE_FLOW_MAPPING_VALUE_STATE Expect a value of a flow mapping.

YAML_PARSE_FLOW_MAPPING_EMPTY_VALUE_STATE Expect an empty value of a flow mapping.

YAML_PARSE_END_STATE Expect nothing.

5.8.4 Function Documentation

5.8.4.1 yaml_parser_delete (yaml_parser_t * *parser*)

Destroy a parser.

Parameters

`in,out`	*parser*	A parser object.

5.8.4.2 yaml_parser_initialize (yaml_parser_t * *parser*)

Initialize a parser.

This function creates a new parser object. An application is responsible for destroying the object using the yaml_parser_delete() function.

Parameters

`out`	*parser*	An empty parser object.

Returns

`1` if the function succeeded, `0` on error.

5.8.4.3 yaml_parser_load (yaml_parser_t * *parser*, yaml_document_t * *document*)

Parse the input stream and produce the next YAML document.

Call this function subsequently to produce a sequence of documents constituting the input stream.

If the produced document has no root node, it means that the document end has been reached.

An application is responsible for freeing any data associated with the produced document object using the yaml_document_delete() function.

An application must not alternate the calls of yaml_parser_load() with the calls of yaml_parser_scan() or yaml_parser_parse(). Doing this will break the parser.

Parameters

in,out	*parser*	A parser object.
out	*document*	An empty document object.

Returns

1 if the function succeeded, 0 on error.

5.8.4.4 yaml_parser_parse (yaml_parser_t * *parser*, yaml_event_t * *event*)

Parse the input stream and produce the next parsing event.

Call the function subsequently to produce a sequence of events corresponding to the input stream. The initial event has the type YAML_STREAM_START_EVENT while the ending event has the type YAML_STREAM_END_EVENT.

An application is responsible for freeing any buffers associated with the produced event object using the yaml_event_delete() function.

An application must not alternate the calls of yaml_parser_parse() with the calls of yaml_parser_scan() or yaml_parser_load(). Doing this will break the parser.

Parameters

in,out	*parser*	A parser object.
out	*event*	An empty event object.

Returns

1 if the function succeeded, 0 on error.

5.8.4.5 yaml_parser_scan (yaml_parser_t * *parser*, yaml_token_t * *token*)

Scan the input stream and produce the next token.

Call the function subsequently to produce a sequence of tokens corresponding to the input stream. The initial token has the type YAML_STREAM_START_TOKEN while the ending token has the type YAML_STREAM_END_TOKEN.

An application is responsible for freeing any buffers associated with the produced token object using the yaml_token_delete function.

An application must not alternate the calls of yaml_parser_scan() with the calls of yaml_parser_parse() or yaml_parser_load(). Doing this will break the parser.

Parameters

in,out	*parser*	A parser object.
out	*token*	An empty token object.

Returns

1 if the function succeeded, 0 on error.

5.8.4.6 yaml_parser_set_encoding (yaml_parser_t * *parser*, yaml_encoding_t *encoding*)

Set the source encoding.

Parameters

in,out	*parser*	A parser object.
in	*encoding*	The source encoding.

5.8.4.7 yaml_parser_set_input (yaml_parser_t * *parser*, yaml_read_handler_t * *handler*, void * *data*)

Set a generic input handler.

Parameters

in,out	*parser*	A parser object.
in	*handler*	A read handler.
in	*data*	Any application data for passing to the read handler.

5.8.4.8 yaml_parser_set_input_file (yaml_parser_t * *parser*, FILE * *file*)

Set a file input.

file should be a file object open for reading. The application is responsible for closing the *file*.

Parameters

in,out	*parser*	A parser object.
in	*file*	An open file.

5.8.4.9 yaml_parser_set_input_string (yaml_parser_t * *parser*, const unsigned char * *input*, size_t *size*)

Set a string input.

Note that the *input* pointer must be valid while the *parser* object exists. The application is responsible for destroing *input* after destroying the *parser*.

Parameters

in,out	*parser*	A parser object.
in	*input*	A source data.
in	*size*	The length of the source data in bytes.

5.9 Emitter Definitions

Classes

- struct yaml_emitter_s

Typedefs

- typedef int yaml_write_handler_t (void *data, unsigned char *buffer, size_t size)
- typedef enum yaml_emitter_state_e yaml_emitter_state_t
- typedef struct yaml_emitter_s yaml_emitter_t

Enumerations

- enum yaml_emitter_state_e {
  YAML_EMIT_STREAM_START_STATE, YAML_EMIT_FIRST_DOCUMENT_START_STATE, YAML_EMIT_DOCUMENT_START_STATE, YAML_EMIT_DOCUMENT_CONTENT_STATE,
  YAML_EMIT_DOCUMENT_END_STATE, YAML_EMIT_FLOW_SEQUENCE_FIRST_ITEM_STATE, YAML_EMIT_FLOW_SEQUENCE_ITEM_STATE, YAML_EMIT_FLOW_MAPPING_FIRST_KEY_STATE,
  YAML_EMIT_FLOW_MAPPING_KEY_STATE, YAML_EMIT_FLOW_MAPPING_SIMPLE_VALUE_STATE,
  YAML_EMIT_FLOW_MAPPING_VALUE_STATE, YAML_EMIT_BLOCK_SEQUENCE_FIRST_ITEM_STATE,
  YAML_EMIT_BLOCK_SEQUENCE_ITEM_STATE, YAML_EMIT_BLOCK_MAPPING_FIRST_KEY_STATE, YAML_EMIT_BLOCK_MAPPING_KEY_STATE, YAML_EMIT_BLOCK_MAPPING_SIMPLE_VALUE_STATE,
  YAML_EMIT_BLOCK_MAPPING_VALUE_STATE, YAML_EMIT_END_STATE }

Functions

- yaml_emitter_initialize (yaml_emitter_t *emitter)
- yaml_emitter_delete (yaml_emitter_t *emitter)
- yaml_emitter_set_output_string (yaml_emitter_t *emitter, unsigned char *output, size_t size, size_t *size_written)
- yaml_emitter_set_output_file (yaml_emitter_t *emitter, FILE *file)
- yaml_emitter_set_output (yaml_emitter_t *emitter, yaml_write_handler_t *handler, void *data)
- yaml_emitter_set_encoding (yaml_emitter_t *emitter, yaml_encoding_t encoding)
- yaml_emitter_set_canonical (yaml_emitter_t *emitter, int canonical)
- yaml_emitter_set_indent (yaml_emitter_t *emitter, int indent)
- yaml_emitter_set_width (yaml_emitter_t *emitter, int width)
- yaml_emitter_set_unicode (yaml_emitter_t *emitter, int unicode)
- yaml_emitter_set_break (yaml_emitter_t *emitter, yaml_break_t line_break)
- yaml_emitter_emit (yaml_emitter_t *emitter, yaml_event_t *event)
- yaml_emitter_open (yaml_emitter_t *emitter)
- yaml_emitter_close (yaml_emitter_t *emitter)
- yaml_emitter_dump (yaml_emitter_t *emitter, yaml_document_t *document)
- yaml_emitter_flush (yaml_emitter_t *emitter)

5.9.1 Detailed Description

5.9.2 Typedef Documentation

5.9.2.1 typedef enum yaml_emitter_state_e yaml_emitter_state_t

The emitter states.

5.9.2.2 typedef struct yaml_emitter_s yaml_emitter_t

The emitter structure.

All members are internal. Manage the structure using the `yaml_emitter_` family of functions.

5.9.2.3 typedef int yaml_write_handler_t(void *data, unsigned char *buffer, size_t size)

The prototype of a write handler.

The write handler is called when the emitter needs to flush the accumulated characters to the output. The handler should write *size* bytes of the *buffer* to the output.

Parameters

`in,out`	*data*	A pointer to an application data specified by yaml_emitter_set_output().
`in`	*buffer*	The buffer with bytes to be written.
`in`	*size*	The size of the buffer.

Returns

On success, the handler should return `1`. If the handler failed, the returned value should be `0`.

5.9.3 Enumeration Type Documentation

5.9.3.1 enum yaml_emitter_state_e

The emitter states.

Enumerator

YAML_EMIT_STREAM_START_STATE Expect STREAM-START.

YAML_EMIT_FIRST_DOCUMENT_START_STATE Expect the first DOCUMENT-START or STREAM-END.

YAML_EMIT_DOCUMENT_START_STATE Expect DOCUMENT-START or STREAM-END.

YAML_EMIT_DOCUMENT_CONTENT_STATE Expect the content of a document.

YAML_EMIT_DOCUMENT_END_STATE Expect DOCUMENT-END.

YAML_EMIT_FLOW_SEQUENCE_FIRST_ITEM_STATE Expect the first item of a flow sequence.

YAML_EMIT_FLOW_SEQUENCE_ITEM_STATE Expect an item of a flow sequence.

YAML_EMIT_FLOW_MAPPING_FIRST_KEY_STATE Expect the first key of a flow mapping.

YAML_EMIT_FLOW_MAPPING_KEY_STATE Expect a key of a flow mapping.

YAML_EMIT_FLOW_MAPPING_SIMPLE_VALUE_STATE Expect a value for a simple key of a flow mapping.

YAML_EMIT_FLOW_MAPPING_VALUE_STATE Expect a value of a flow mapping.

YAML_EMIT_BLOCK_SEQUENCE_FIRST_ITEM_STATE Expect the first item of a block sequence.

YAML_EMIT_BLOCK_SEQUENCE_ITEM_STATE Expect an item of a block sequence.

YAML_EMIT_BLOCK_MAPPING_FIRST_KEY_STATE Expect the first key of a block mapping.

YAML_EMIT_BLOCK_MAPPING_KEY_STATE Expect the key of a block mapping.

YAML_EMIT_BLOCK_MAPPING_SIMPLE_VALUE_STATE Expect a value for a simple key of a block mapping.

YAML_EMIT_BLOCK_MAPPING_VALUE_STATE Expect a value of a block mapping.

YAML_EMIT_END_STATE Expect nothing.

5.9.4 Function Documentation

5.9.4.1 yaml_emitter_close (yaml_emitter_t * *emitter*)

Finish a YAML stream.

This function should be used after yaml_emitter_dump() is called.

Parameters

in,out	*emitter*	An emitter object.

Returns

1 if the function succeeded, 0 on error.

5.9.4.2 yaml_emitter_delete (yaml_emitter_t * *emitter*)

Destroy an emitter.

Parameters

in,out	*emitter*	An emitter object.

5.9.4.3 yaml_emitter_dump (yaml_emitter_t * *emitter*, yaml_document_t * *document*)

Emit a YAML document.

The documen object may be generated using the yaml_parser_load() function or the yaml_document_initialize() function. The emitter takes the responsibility for the document object and destoys its content after it is emitted. The document object is destroyedeven if the function fails.

Parameters

in,out	*emitter*	An emitter object.
in,out	*document*	A document object.

Returns

1 if the function succeeded, 0 on error.

5.9.4.4 yaml_emitter_emit (yaml_emitter_t * *emitter*, yaml_event_t * *event*)

Emit an event.

The event object may be generated using the yaml_parser_parse() function. The emitter takes the responsibility for the event object and destroys its content after it is emitted. The event object is destroyed even if the function fails.

Parameters

in,out	*emitter*	An emitter object.
in,out	*event*	An event object.

Returns

`1` if the function succeeded, `0` on error.

5.9.4.5 yaml_emitter_flush (yaml_emitter_t * *emitter*)

Flush the accumulated characters to the output.

Parameters

`in,out`	*emitter*	An emitter object.

Returns

`1` if the function succeeded, `0` on error.

5.9.4.6 yaml_emitter_initialize (yaml_emitter_t * *emitter*)

Initialize an emitter.

This function creates a new emitter object. An application is responsible for destroying the object using the yaml_emitter_delete() function.

Parameters

`out`	*emitter*	An empty parser object.

Returns

`1` if the function succeeded, `0` on error.

5.9.4.7 yaml_emitter_open (yaml_emitter_t * *emitter*)

Start a YAML stream.

This function should be used before yaml_emitter_dump() is called.

Parameters

`in,out`	*emitter*	An emitter object.

Returns

`1` if the function succeeded, `0` on error.

5.9.4.8 yaml_emitter_set_break (yaml_emitter_t * *emitter*, yaml_break_t *line_break*)

Set the preferred line break.

Parameters

`in,out`	*emitter*	An emitter object.
`in`	*line_break*	The preferred line break.

5.9.4.9 yaml_emitter_set_canonical (yaml_emitter_t * *emitter*, int *canonical*)

Set if the output should be in the "canonical" format as in the YAML specification.

Parameters

in,out	*emitter*	An emitter object.
in	*canonical*	If the output is canonical.

5.9.4.10 yaml_emitter_set_encoding (yaml_emitter_t * *emitter*, yaml_encoding_t *encoding*)

Set the output encoding.

Parameters

in,out	*emitter*	An emitter object.
in	*encoding*	The output encoding.

5.9.4.11 yaml_emitter_set_indent (yaml_emitter_t * *emitter*, int *indent*)

Set the intendation increment.

Parameters

in,out	*emitter*	An emitter object.
in	*indent*	The indentation increment ($1 < . < 10$).

5.9.4.12 yaml_emitter_set_output (yaml_emitter_t * *emitter*, yaml_write_handler_t * *handler*, void * *data*)

Set a generic output handler.

Parameters

in,out	*emitter*	An emitter object.
in	*handler*	A write handler.
in	*data*	Any application data for passing to the write handler.

5.9.4.13 yaml_emitter_set_output_file (yaml_emitter_t * *emitter*, FILE * *file*)

Set a file output.

file should be a file object open for writing. The application is responsible for closing the *file*.

Parameters

in,out	*emitter*	An emitter object.
in	*file*	An open file.

5.9.4.14 yaml_emitter_set_output_string (yaml_emitter_t * *emitter*, unsigned char * *output*, size_t *size*, size_t * *size_written*)

Set a string output.

The emitter will write the output characters to the *output* buffer of the size *size*. The emitter will set *size_written* to

the number of written bytes. If the buffer is smaller than required, the emitter produces the YAML_WRITE_ERROR error.

Parameters

in,out	*emitter*	An emitter object.
in	*output*	An output buffer.
in	*size*	The buffer size.
in	*size_written*	The pointer to save the number of written bytes.

5.9.4.15 yaml_emitter_set_unicode (yaml_emitter_t * *emitter,* int *unicode*)

Set if unescaped non-ASCII characters are allowed.

Parameters

in,out	*emitter*	An emitter object.
in	*unicode*	If unescaped Unicode characters are allowed.

5.9.4.16 yaml_emitter_set_width (yaml_emitter_t * *emitter,* int *width*)

Set the preferred line width. `-1` means unlimited.

Parameters

in,out	*emitter*	An emitter object.
in	*width*	The preferred line width.

Chapter 6

Class Documentation

6.1 ARNOLDI_DATA Struct Reference

`#include <lark.h>`

Public Attributes

- int k
- int iter
- double beta
- double hp1
- bool Output = true
- std::vector< Matrix< double > > Vk
- Matrix< double > Hkp1
- Matrix< double > yk
- Matrix< double > e1
- Matrix< double > w
- Matrix< double > v
- Matrix< double > sum

6.1.1 Member Data Documentation

6.1.1.1 double ARNOLDI_DATA::beta

6.1.1.2 Matrix<double> ARNOLDI_DATA::e1

6.1.1.3 Matrix<double> ARNOLDI_DATA::Hkp1

6.1.1.4 double ARNOLDI_DATA::hp1

6.1.1.5 int ARNOLDI_DATA::iter

6.1.1.6 int ARNOLDI_DATA::k

6.1.1.7 bool ARNOLDI_DATA::Output = true

6.1.1.8 Matrix<double> ARNOLDI_DATA::sum

6.1.1.9 Matrix<double> ARNOLDI_DATA::v

6.1.1.10 std::vector< Matrix<double> > ARNOLDI_DATA::Vk

6.1.1.11 Matrix<double> ARNOLDI_DATA::w

6.1.1.12 Matrix<double> ARNOLDI_DATA::yk

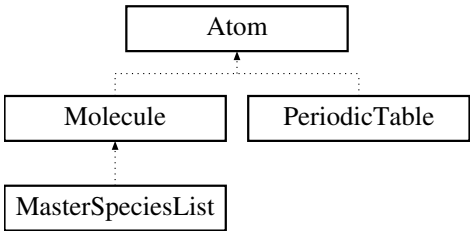
The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/lark.h

6.2 Atom Class Reference

`#include <eel.h>`

Inheritance diagram for Atom:



Public Member Functions

- Atom ()
- ~Atom ()
- Atom (std::string Name)
- Atom (int number)
- void Register (std::string Symbol)
- void Register (int number)
- void editAtomicWeight (double AW)
- void editOxidationState (int state)
- void editProtons (int proton)
- void editNeutrons (int neutron)
- void editElectrons (int electron)
- void editValence (int val)
- void removeProton ()
- void removeNeutron ()
- void removeElectron ()
- double AtomicWeight ()
- int OxidationState ()
- int Protons ()
- int Neutrons ()
- int Electrons ()
- int BondingElectrons ()
- std::string AtomName ()
- std::string AtomSymbol ()
- std::string AtomCategory ()
- std::string AtomState ()
- int AtomicNumber ()
- void DisplayInfo ()

Protected Attributes

- double atomic_weight
- int oxidation_state
- int protons
- int neutrons
- int electrons
- int valence_e

Private Attributes

- std::string Name
- std::string Symbol
- std::string Category
- std::string NaturalState
- int atomic_number

6.2.1 Constructor & Destructor Documentation

6.2.1.1 Atom::Atom ( )

6.2.1.2 Atom::~Atom ( )

6.2.1.3 Atom::Atom (std::string *Name*)

6.2.1.4 Atom::Atom (int *number*)

6.2.2 Member Function Documentation

6.2.2.1 std::string Atom::AtomCategory ( )

6.2.2.2 int Atom::AtomicNumber ( )

6.2.2.3 double Atom::AtomicWeight ( )

6.2.2.4 std::string Atom::AtomName ( )

6.2.2.5 std::string Atom::AtomState ( )

6.2.2.6 std::string Atom::AtomSymbol ( )

6.2.2.7 int Atom::BondingElectrons ( )

6.2.2.8 void Atom::DisplayInfo ( )

6.2.2.9 void Atom::editAtomicWeight (double *AW*)

6.2.2.10 void Atom::editElectrons (int *electron*)

6.2.2.11 void Atom::editNeutrons (int *neutron*)

6.2.2.12 void Atom::editOxidationState (int *state*)

6.2.2.13 void Atom::editProtons (int *proton*)

6.2.2.14 void Atom::editValence (int *val*)

6.2.2.15 int Atom::Electrons ( )

6.2.2.16 int Atom::Neutrons ( )

6.2.2.17 int Atom::OxidationState ( )

6.2.2.18 int Atom::Protons ( )

6.2.2.19 void Atom::Register (std::string *Symbol*)

6.2.2.20 void Atom::Register (int *number*)

6.2.2.21 void Atom::removeElectron ( )

6.2.2.22 void Atom::removeNeutron ( )

6.2.2.23 void Atom::removeProton ( )

6.2.3 Member Data Documentation

6.2.3.1 int Atom::atomic_number [private]

6.2.3.2 double Atom::atomic_weight [protected]

6.2.3.3 std::string Atom::Category [private]

6.2.3.4 int Atom::electrons [protected]

6.2.3.5 std::string Atom::Name [private]

6.2.3.6 std::string Atom::NaturalState [private]

6.2.3.7 int Atom::neutrons [protected]

6.2.3.8 int Atom::oxidation_state [protected]

6.2.3.9 int Atom::protons [protected]

6.2.3.10 std::string Atom::Symbol [private]

6.2.3.11 int Atom::valence_e [protected]

The documentation for this class was generated from the following files:

- /Users/aladshaw3/projects/ecosystem/include/eel.h
- /Users/aladshaw3/projects/ecosystem/src/eel.cpp

6.3 BACKTRACK_DATA Struct Reference

`#include <lark.h>`

Public Attributes

- double alpha = 1e-4
- double rho = 0.1
- double lambdaMin =DBL_EPSILON
- double normFkp1
- bool constRho = false
- Matrix< double > Fk
- Matrix< double > xk

6.3.1 Member Data Documentation

6.3.1.1 double BACKTRACK_DATA::alpha = 1e-4

6.3.1.2 bool BACKTRACK_DATA::constRho = false

6.3.1.3 Matrix<double> BACKTRACK_DATA::Fk

6.3.1.4 double BACKTRACK_DATA::lambdaMin =DBL_EPSILON

6.3.1.5 double BACKTRACK_DATA::normFkp1

6.3.1.6 double BACKTRACK_DATA::rho = 0.1

6.3.1.7 Matrix<double> BACKTRACK_DATA::xk

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/lark.h

6.4 BiCGSTAB_DATA Struct Reference

```
#include <lark.h>
```

Public Attributes

- int maxit = 0
- int iter = 0
- bool breakdown
- double alpha
- double beta
- double rho
- double rho_old
- double omega
- double omega_old
- double tol_rel = 1e-6
- double tol_abs = 1e-6
- double res
- double relres
- double relres_base
- double bestres
- bool Output = true
- Matrix< double > x

- Matrix< double > bestx
- Matrix< double > r
- Matrix< double > r0
- Matrix< double > v
- Matrix< double > p
- Matrix< double > y
- Matrix< double > s
- Matrix< double > z
- Matrix< double > t

6.4.1 Member Data Documentation

6.4.1.1 double BiCGSTAB_DATA::alpha

6.4.1.2 double BiCGSTAB_DATA::bestres

6.4.1.3 Matrix<double> BiCGSTAB_DATA::bestx

6.4.1.4 double BiCGSTAB_DATA::beta

6.4.1.5 bool BiCGSTAB_DATA::breakdown

6.4.1.6 int BiCGSTAB_DATA::iter = 0

6.4.1.7 int BiCGSTAB_DATA::maxit = 0

6.4.1.8 double BiCGSTAB_DATA::omega

6.4.1.9 double BiCGSTAB_DATA::omega_old

6.4.1.10 bool BiCGSTAB_DATA::Output = true

6.4.1.11 Matrix<double> BiCGSTAB_DATA::p

6.4.1.12 Matrix<double> BiCGSTAB_DATA::r

6.4.1.13 Matrix<double> BiCGSTAB_DATA::r0

6.4.1.14 double BiCGSTAB_DATA::relres

6.4.1.15 double BiCGSTAB_DATA::relres_base

6.4.1.16 double BiCGSTAB_DATA::res

6.4.1.17 double BiCGSTAB_DATA::rho

6.4.1.18 double BiCGSTAB_DATA::rho_old

6.4.1.19 Matrix<double> BiCGSTAB_DATA::s

6.4.1.20 Matrix<double> BiCGSTAB_DATA::t

6.4.1.21 double BiCGSTAB_DATA::tol_abs = 1e-6

6.4.1.22 double BiCGSTAB_DATA::tol_rel = 1e-6

6.4.1.23 Matrix<double> BiCGSTAB_DATA::v

6.4.1.24 Matrix<double> BiCGSTAB_DATA::x

6.4.1.25 Matrix<double> BiCGSTAB_DATA::y

6.4.1.26 Matrix<double> BiCGSTAB_DATA::z

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/lark.h

6.5 CGS_DATA Struct Reference

`#include <lark.h>`

Public Attributes

- int maxit = 0
- int iter = 0
- bool breakdown
- double alpha
- double beta
- double rho
- double sigma
- double tol_rel = 1e-6
- double tol_abs = 1e-6
- double res
- double relres
- double relres_base
- double bestres
- bool Output = true
- Matrix< double > x
- Matrix< double > bestx
- Matrix< double > r
- Matrix< double > r0
- Matrix< double > u
- Matrix< double > w
- Matrix< double > v
- Matrix< double > p
- Matrix< double > c
- Matrix< double > z

6.5.1 Member Data Documentation

6.5.1.1 double CGS_DATA::alpha

6.5.1.2 double CGS_DATA::bestres

6.5.1.3 Matrix<double> CGS_DATA::bestx

6.5.1.4 double CGS_DATA::beta

6.5.1.5 bool CGS_DATA::breakdown

6.5.1.6 Matrix<double> CGS_DATA::c

6.5.1.7 int CGS_DATA::iter = 0

6.5.1.8 int CGS_DATA::maxit = 0

6.5.1.9 bool CGS_DATA::Output = true

6.5.1.10 Matrix<double> CGS_DATA::p

6.5.1.11 Matrix<double> CGS_DATA::r

6.5.1.12 Matrix<double> CGS_DATA::r0

6.5.1.13 double CGS_DATA::relres

6.5.1.14 double CGS_DATA::relres_base

6.5.1.15 double CGS_DATA::res

6.5.1.16 double CGS_DATA::rho

6.5.1.17 double CGS_DATA::sigma

6.5.1.18 double CGS_DATA::tol_abs = 1e-6

6.5.1.19 double CGS_DATA::tol_rel = 1e-6

6.5.1.20 Matrix<double> CGS_DATA::u

6.5.1.21 Matrix<double> CGS_DATA::v

6.5.1.22 Matrix<double> CGS_DATA::w

6.5.1.23 Matrix<double> CGS_DATA::x

6.5.1.24 Matrix<double> CGS_DATA::z

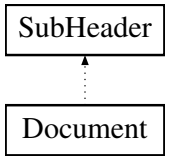
The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/lark.h

6.6 Document Class Reference

`#include <yaml_wrapper.h>`

Inheritance diagram for Document:



Public Member Functions

- Document ()
- ~Document ()
- Document (const Document &doc)
- Document (std::string name)
- Document (const KeyValueMap &map)
- Document (std::string name, const KeyValueMap &map)
- Document (std::string key, const Header &head)
- Document & operator= (const Document &doc)
- ValueTypePair & operator[] (const std::string key)
- ValueTypePair operator[] (const std::string key) const
- Header & operator() (const std::string key)
- Header operator() (const std::string key) const
- std::map< std::string, Header > & getHeadMap ()
- KeyValueMap & getDataMap ()
- Header & getHeader (std::string key)
- std::map< std::string, Header > ::const_iterator end () const
- std::map< std::string, Header > ::iterator end ()
- std::map< std::string, Header > ::const_iterator begin () const
- std::map< std::string, Header > ::iterator begin ()
- void clear ()
- void resetKeys ()
- void changeKey (std::string oldKey, std::string newKey)
- void revalidateAllKeys ()
- void addPair (std::string key, std::string val)
- void addPair (std::string key, std::string val, int t)
- void setName (std::string name)
- void setAlias (std::string alias)
- void setNameAliasPair (std::string n, std::string a, int s)
- void setState (int state)
- void DisplayContents ()
- void addHeadKey (std::string key)
- void copyAnchor2Alias (std::string alias, Header &ref)
- int size ()
- std::string getName ()
- std::string getAlias ()
- int getState ()
- bool isAlias ()
- bool isAnchor ()
- Header & getAnchoredHeader (std::string alias)
- Header & getHeadFromSubAlias (std::string alias)

Private Attributes

- std::map< std::string, Header > Head_Map

Additional Inherited Members

6.6.1 Constructor & Destructor Documentation

6.6.1.1 Document::Document ( )

6.6.1.2 Document::~Document ( )

6.6.1.3 Document::Document (const **Document** & *doc*)

6.6.1.4 Document::Document (std::string *name*)

6.6.1.5 Document::Document (const **KeyValueMap** & *map*)

6.6.1.6 Document::Document (std::string *name,* const **KeyValueMap** & *map*)

6.6.1.7 Document::Document (std::string *key,* const **Header** & *head*)

6.6.2 Member Function Documentation

6.6.2.1 void Document::addHeadKey (std::string *key*)

6.6.2.2 void Document::addPair (std::string *key,* std::string *val*)

6.6.2.3 void Document::addPair (std::string *key,* std::string *val,* int *t*)

6.6.2.4 std::map< std::string, **Header** >::const_iterator Document::begin ( ) const

6.6.2.5 std::map< std::string, **Header** >::iterator Document::begin ( )

6.6.2.6 void Document::changeKey (std::string *oldKey,* std::string *newKey*)

6.6.2.7 void Document::clear ( )

6.6.2.8 void Document::copyAnchor2Alias (std::string *alias,* **Header** & *ref*)

6.6.2.9 void Document::DisplayContents ( )

6.6.2.10 std::map< std::string, **Header** >::const_iterator Document::end ( ) const

6.6.2.11 std::map< std::string, **Header** >::iterator Document::end ( )

6.6.2.12 std::string Document::getAlias ( )

6.6.2.13 **Header** & Document::getAnchoredHeader (std::string *alias*)

6.6.2.14 **KeyValueMap** & Document::getDataMap ( )

6.6.2.15 **Header** & Document::getHeader (std::string *key*)

6.6.2.16 **Header** & Document::getHeadFromSubAlias (std::string *alias*)

6.6.2.17 std::map< std::string, **Header** > & Document::getHeadMap ( )

6.6.2.18 std::string Document::getName ( )

6.6.2.19 int Document::getState ( )

6.6.2.20 bool Document::isAlias ( )

6.6.2.21 bool Document::isAnchor ( )

6.6.2.22 Header & Document::operator() (const std::string *key*)

6.6.2.23 Header Document::operator() (const std::string *key*) const

6.6.2.24 Document & Document::operator= (const Document & *doc*)

6.6.2.25 ValueTypePair & Document::operator[] (const std::string *key*)

6.6.2.26 ValueTypePair Document::operator[] (const std::string *key*) const

6.6.2.27 void Document::resetKeys ( )

6.6.2.28 void Document::revalidateAllKeys ( )

6.6.2.29 void Document::setAlias (std::string *alias*)

6.6.2.30 void Document::setName (std::string *name*)

6.6.2.31 void Document::setNameAliasPair (std::string *n*, std::string *a*, int *s*)

6.6.2.32 void Document::setState (int *state*)

6.6.2.33 int Document::size ( )

6.6.3 Member Data Documentation

6.6.3.1 std::map<std::string, Header> Document::Head_Map [private]

The documentation for this class was generated from the following files:

- /Users/aladshaw3/projects/ecosystem/include/yaml_wrapper.h
- /Users/aladshaw3/projects/ecosystem/src/yaml_wrapper.cpp

6.7 DOGFISH_DATA Struct Reference

`#include <dogfish.h>`

Public Attributes

- unsigned long int total_steps = 0
- double time_old = 0.0
- double time = 0.0
- bool Print2File = true
- bool Print2Console = true
- bool DirichletBC = false
- bool NonLinear = false
- double t_counter = 0.0
- double t_print

- int NumComp
- double end_time
- double total_sorption_old
- double total_sorption
- double fiber_length
- double fiber_diameter
- FILE * OutputFile
- double(* eval_R)(int i, int l, const void *data)
- double(* eval_Dl)(int i, int l, const void *data)
- double(* eval_kf)(int i, const void *data)
- double(* eval_qs)(int i, const void *data)
- const void * user_data
- std::vector< FINCH_DATA > finch_dat
- std::vector< DOGFISH_PARAM > param_dat

6.7.1 Member Data Documentation

6.7.1.1 bool DOGFISH_DATA::DirichletBC = false

6.7.1.2 double DOGFISH_DATA::end_time

6.7.1.3 double(* DOGFISH_DATA::eval_Dl)(int i, int l, const void *data)

6.7.1.4 double(* DOGFISH_DATA::eval_kf)(int i, const void *data)

6.7.1.5 double(* DOGFISH_DATA::eval_qs)(int i, const void *data)

6.7.1.6 double(* DOGFISH_DATA::eval_R)(int i, int l, const void *data)

6.7.1.7 double DOGFISH_DATA::fiber_diameter

6.7.1.8 double DOGFISH_DATA::fiber_length

6.7.1.9 std::vector<FINCH_DATA> DOGFISH_DATA::finch_dat

6.7.1.10 bool DOGFISH_DATA::NonLinear = false

6.7.1.11 int DOGFISH_DATA::NumComp

6.7.1.12 FILE* DOGFISH_DATA::OutputFile

6.7.1.13 std::vector<DOGFISH_PARAM> DOGFISH_DATA::param_dat

6.7.1.14 bool DOGFISH_DATA::Print2Console = true

6.7.1.15 bool DOGFISH_DATA::Print2File = true

6.7.1.16 double DOGFISH_DATA::t_counter = 0.0

6.7.1.17 double DOGFISH_DATA::t_print

6.7.1.18 double DOGFISH_DATA::time = 0.0

6.7.1.19 double DOGFISH_DATA::time_old = 0.0

6.7.1.20 double DOGFISH_DATA::total_sorption

6.7.1.21 double DOGFISH_DATA::total_sorption_old

6.7.1.22 unsigned long int DOGFISH_DATA::total_steps = 0

6.7.1.23 const void* DOGFISH_DATA::user_data

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/dogfish.h

6.8 DOGFISH_PARAM Struct Reference

`#include <dogfish.h>`

Public Attributes

- double intraparticle_diffusion
- double film_transfer_coeff
- double surface_concentration
- double initial_sorption
- double sorbed_molefraction
- Molecule species

6.8.1 Member Data Documentation

6.8.1.1 double DOGFISH_PARAM::film_transfer_coeff

6.8.1.2 double DOGFISH_PARAM::initial_sorption

6.8.1.3 double DOGFISH_PARAM::intraparticle_diffusion

6.8.1.4 double DOGFISH_PARAM::sorbed_molefraction

6.8.1.5 Molecule DOGFISH_PARAM::species

6.8.1.6 double DOGFISH_PARAM::surface_concentration

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/dogfish.h

6.9 EX01_DATA Struct Reference

`#include <lark.h>`

Public Attributes

- Matrix< double > M
- Matrix< double > b

6.9.1 Member Data Documentation

6.9.1.1 Matrix<double> EX01_DATA::b

6.9.1.2 Matrix<double> EX01_DATA::M

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/lark.h

6.10 EX02_DATA Struct Reference

`#include <lark.h>`

Public Attributes

- Matrix< double > M
- Matrix< double > b

6.10.1 Member Data Documentation

6.10.1.1 Matrix<double> EX02_DATA::b

6.10.1.2 Matrix<double> EX02_DATA::M

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/lark.h

6.11 EX04_DATA Struct Reference

`#include <lark.h>`

Public Attributes

- Matrix< double > M
- Matrix< double > b

6.11.1 Member Data Documentation

6.11.1.1 Matrix<double> EX04_DATA::b

6.11.1.2 Matrix<double> EX04_DATA::M

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/lark.h

6.12 EX09_DATA Struct Reference

`#include <lark.h>`

Public Attributes

- double h
- double k
- int N
- Matrix< double > x
- Matrix< double > M
- Matrix< double > s
- Matrix< double > p

6.12.1 Member Data Documentation

6.12.1.1 double EX09_DATA::h

6.12.1.2 double EX09_DATA::k

6.12.1.3 Matrix<double> EX09_DATA::M

6.12.1.4 int EX09_DATA::N

6.12.1.5 Matrix<double> EX09_DATA::p

6.12.1.6 Matrix<double> EX09_DATA::s

6.12.1.7 Matrix<double> EX09_DATA::x

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/lark.h

6.13 EX15_DATA Struct Reference

`#include <lark.h>`

Public Attributes

- int N
- int m
- Matrix< double > b

6.13.1 Member Data Documentation

6.13.1.1 Matrix<double> EX15_DATA::b

6.13.1.2 int EX15_DATA::m

6.13.1.3 int EX15_DATA::N

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/lark.h

6.14 FINCH_DATA Struct Reference

`#include <finch.h>`

Public Attributes

- int d = 0
- double dt = 0.0125
- double dt_old = 0.0125
- double T = 1.0
- double dz = 0.1
- double L = 1.0
- double s = 1.0
- double t = 0.0
- double t_old = 0.0
- double uT = 0.0
- double uT_old = 0.0
- double uAvg = 0.0
- double uAvg_old = 0.0
- double uIC = 0.0
- double vIC = 1.0
- double DIC = 1.0
- double kIC = 1.0
- double RIC = 1.0
- double uo = 1.0
- double vo = 1.0
- double Do = 1.0
- double ko = 1.0
- double Ro = 1.0
- double kfn = 1.0
- double kfnp1 = 1.0
- double lambda_I
- double lambda_E
- int LN = 10
- bool CN = true
- bool Update = false
- bool Dirichlet = false
- bool CheckMass = false
- bool ExplicitFlux = false
- bool Iterative = true
- bool SteadyState = false
- bool NormTrack = true
- double beta = 0.5
- double tol_rel = 1e-6
- double tol_abs = 1e-6
- int max_iter = 20
- int total_iter = 0

- int nl_method = FINCH_Picard
- std::vector< double > CL_I
- std::vector< double > CL_E
- std::vector< double > CC_I
- std::vector< double > CC_E
- std::vector< double > CR_I
- std::vector< double > CR_E
- std::vector< double > fL_I
- std::vector< double > fL_E
- std::vector< double > fC_I
- std::vector< double > fC_E
- std::vector< double > fR_I
- std::vector< double > fR_E
- std::vector< double > OI
- std::vector< double > OE
- std::vector< double > NI
- std::vector< double > NE
- std::vector< double > MI
- std::vector< double > ME
- std::vector< double > uz_I_I
- std::vector< double > uz_Im1_I
- std::vector< double > uz_Ip1_I
- std::vector< double > uz_I_E
- std::vector< double > uz_Im1_E
- std::vector< double > uz_Ip1_E
- Matrix< double > unm1
- Matrix< double > un
- Matrix< double > unp1
- Matrix< double > u_star
- Matrix< double > ubest
- Matrix< double > vn
- Matrix< double > vnp1
- Matrix< double > Dn
- Matrix< double > Dnp1
- Matrix< double > kn
- Matrix< double > knp1
- Matrix< double > Sn
- Matrix< double > Snp1
- Matrix< double > Rn
- Matrix< double > Rnp1
- Matrix< double > Fn
- Matrix< double > Fnp1
- Matrix< double > gI
- Matrix< double > gE
- Matrix< double > res
- Matrix< double > pres
- int(* callroutine)(const void *user_data)
- int(* setic)(const void *user_data)
- int(* settime)(const void *user_data)
- int(* setpreprocess)(const void *user_data)
- int(* solve)(const void *user_data)
- int(* setparams)(const void *user_data)
- int(* discretize)(const void *user_data)
- int(* setbcs)(const void *user_data)
- int(* evalres)(const Matrix< double > &x, Matrix< double > &res, const void *user_data)

- int(∗ evalprecon)(const Matrix< double > &b, Matrix< double > &p, const void ∗user_data)
- int(∗ setpostprocess)(const void ∗user_data)
- int(∗ resettime)(const void ∗user_data)
- PICARD_DATA picard_dat
- PJFNK_DATA pjfnk_dat
- const void ∗ param_data

6.14.1 Member Data Documentation

6.14.1.1 double FINCH_DATA::beta = 0.5

6.14.1.2 int(∗ FINCH_DATA::callroutine)(const void ∗user_data)

6.14.1.3 std::vector<double> FINCH_DATA::CC_E

6.14.1.4 std::vector<double> FINCH_DATA::CC_I

6.14.1.5 bool FINCH_DATA::CheckMass = false

6.14.1.6 std::vector<double> FINCH_DATA::CL_E

6.14.1.7 std::vector<double> FINCH_DATA::CL_I

6.14.1.8 bool FINCH_DATA::CN = true

6.14.1.9 std::vector<double> FINCH_DATA::CR_E

6.14.1.10 std::vector<double> FINCH_DATA::CR_I

6.14.1.11 int FINCH_DATA::d = 0

6.14.1.12 double FINCH_DATA::DIC = 1.0

6.14.1.13 bool FINCH_DATA::Dirichlet = false

6.14.1.14 int(∗ FINCH_DATA::discretize)(const void ∗user_data)

6.14.1.15 Matrix<double> FINCH_DATA::Dn

6.14.1.16 Matrix<double> FINCH_DATA::Dnp1

6.14.1.17 double FINCH_DATA::Do = 1.0

6.14.1.18 double FINCH_DATA::dt = 0.0125

6.14.1.19 double FINCH_DATA::dt_old = 0.0125

6.14.1.20 double FINCH_DATA::dz = 0.1

6.14.1.21 int(∗ FINCH_DATA::evalprecon)(const Matrix< double > &b, Matrix< double > &p, const void ∗user_data)

6.14.1.22 int(∗ FINCH_DATA::evalres)(const Matrix< double > &x, Matrix< double > &res, const void ∗user_data)

6.14.1.23 bool FINCH_DATA::ExplicitFlux = false

6.14.1.24 std::vector<double> FINCH_DATA::fC_E

6.14.1.25 std::vector<double> FINCH_DATA::fC_I

6.14.1.26 std::vector<double> FINCH_DATA::fL_E

6.14.1.27 std::vector<double> FINCH_DATA::fL_I

6.14.1.28 Matrix<double> FINCH_DATA::Fn

6.14.1.29 Matrix<double> FINCH_DATA::Fnp1

6.14.1.30 std::vector<double> FINCH_DATA::fR_E

6.14.1.31 std::vector<double> FINCH_DATA::fR_I

6.14.1.32 Matrix<double> FINCH_DATA::gE

6.14.1.33 Matrix<double> FINCH_DATA::gI

6.14.1.34 bool FINCH_DATA::Iterative = true

6.14.1.35 double FINCH_DATA::kfn = 1.0

6.14.1.36 double FINCH_DATA::kfnp1 = 1.0

6.14.1.37 double FINCH_DATA::kIC = 1.0

6.14.1.38 Matrix<double> FINCH_DATA::kn

6.14.1.39 Matrix<double> FINCH_DATA::knp1

6.14.1.40 double FINCH_DATA::ko = 1.0

6.14.1.41 double FINCH_DATA::L = 1.0

6.14.1.42 double FINCH_DATA::lambda_E

6.14.1.43 double FINCH_DATA::lambda_I

6.14.1.44 int FINCH_DATA::LN = 10

6.14.1.45 int FINCH_DATA::max_iter = 20

6.14.1.46 std::vector<double> FINCH_DATA::ME

6.14.1.47 std::vector<double> FINCH_DATA::MI

6.14.1.48 std::vector<double> FINCH_DATA::NE

6.14.1.49 std::vector<double> FINCH_DATA::NI

6.14.1.50 int FINCH_DATA::nl_method = FINCH_Picard

6.14.1.51 bool FINCH_DATA::NormTrack = true

6.14.1.52 std::vector<double> FINCH_DATA::OE

6.14.1.53 std::vector<double> FINCH_DATA::OI

6.14.1.54 const void* FINCH_DATA::param_data

6.14.1.55 PICARD_DATA FINCH_DATA::picard_dat

6.14.1.56 PJFNK_DATA FINCH_DATA::pjfnk_dat

6.14.1.57 Matrix<double> FINCH_DATA::pres

6.14.1.58 Matrix<double> FINCH_DATA::res

6.14.1.59 int(* FINCH_DATA::resettime)(const void *user_data)

6.14.1.60 double FINCH_DATA::RIC = 1.0

6.14.1.61 Matrix<double> FINCH_DATA::Rn

6.14.1.62 Matrix<double> FINCH_DATA::Rnp1

6.14.1.63 double FINCH_DATA::Ro = 1.0

6.14.1.64 double FINCH_DATA::s = 1.0

6.14.1.65 int(* FINCH_DATA::setbcs)(const void *user_data)

6.14.1.66 int(* FINCH_DATA::setic)(const void *user_data)

6.14.1.67 int(* FINCH_DATA::setparams)(const void *user_data)

6.14.1.68 int(* FINCH_DATA::setpostprocess)(const void *user_data)

6.14.1.69 int(* FINCH_DATA::setpreprocess)(const void *user_data)

6.14.1.70 int(* FINCH_DATA::settime)(const void *user_data)

6.14.1.71 Matrix<double> FINCH_DATA::Sn

6.14.1.72 Matrix<double> FINCH_DATA::Snp1

6.14.1.73 int(* FINCH_DATA::solve)(const void *user_data)

6.14.1.74 bool FINCH_DATA::SteadyState = false

6.14.1.75 double FINCH_DATA::T = 1.0

6.14.1.76 double FINCH_DATA::t = 0.0

6.14.1.77 double FINCH_DATA::t_old = 0.0

6.14.1.78 double FINCH_DATA::tol_abs = 1e-6

6.14.1.79 double FINCH_DATA::tol_rel = 1e-6

6.14.1.80 int FINCH_DATA::total_iter = 0

6.14.1.81 Matrix<double> FINCH_DATA::u_star

6.14.1.82 double FINCH_DATA::uAvg = 0.0

6.14.1.83 double FINCH_DATA::uAvg_old = 0.0

6.14.1.84 Matrix<double> FINCH_DATA::ubest

6.14.1.85 double FINCH_DATA::uIC = 0.0

6.14.1.86 Matrix<double> FINCH_DATA::un

6.14.1.87 Matrix<double> FINCH_DATA::unm1

6.14.1.88 Matrix<double> FINCH_DATA::unp1

6.14.1.89 double FINCH_DATA::uo = 1.0

6.14.1.90 bool FINCH_DATA::Update = false

6.14.1.91 double FINCH_DATA::uT = 0.0

6.14.1.92 double FINCH_DATA::uT_old = 0.0

6.14.1.93 std::vector<double> FINCH_DATA::uz_l_E

6.14.1.94 std::vector<double> FINCH_DATA::uz_l_I

6.14.1.95 std::vector<double> FINCH_DATA::uz_lm1_E

6.14.1.96 std::vector<double> FINCH_DATA::uz_lm1_I

6.14.1.97 std::vector<double> FINCH_DATA::uz_lp1_E

6.14.1.98 std::vector<double> FINCH_DATA::uz_lp1_I

6.14.1.99 double FINCH_DATA::vIC = 1.0

6.14.1.100 Matrix<double> FINCH_DATA::vn

6.14.1.101 Matrix<double> FINCH_DATA::vnp1

6.14.1.102 double FINCH_DATA::vo = 1.0

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/finch.h

6.15 GCR_DATA Struct Reference

```
#include <lark.h>
```

Public Attributes

- int restart = -1
- int maxit = 0
- int iter_outer = 0
- int iter_inner = 0
- int total_iter = 0
- bool breakdown = false
- double alpha
- double beta
- double tol_rel = 1e-6
- double tol_abs = 1e-6
- double res
- double relres
- double relres_base
- double bestres
- bool Output = true
- Matrix< double > x
- Matrix< double > bestx
- Matrix< double > r
- Matrix< double > c_temp
- Matrix< double > u_temp
- std::vector< Matrix< double > > u
- std::vector< Matrix< double > > c
- OPTRANS_DATA transpose_dat

6.15.1 Member Data Documentation

6.15.1.1 double GCR_DATA::alpha

6.15.1.2 double GCR_DATA::bestres

6.15.1.3 Matrix<double> GCR_DATA::bestx

6.15.1.4 double GCR_DATA::beta

6.15.1.5 bool GCR_DATA::breakdown = false

6.15.1.6 std::vector<Matrix<double> > GCR_DATA::c

6.15.1.7 Matrix<double> GCR_DATA::c_temp

6.15.1.8 int GCR_DATA::iter_inner = 0

6.15.1.9 int GCR_DATA::iter_outer = 0

6.15.1.10 int GCR_DATA::maxit = 0

6.15.1.11 bool GCR_DATA::Output = true

6.15.1.12 Matrix<double> GCR_DATA::r

6.15.1.13 double GCR_DATA::relres

6.15.1.14 double GCR_DATA::relres_base

6.15.1.15 double GCR_DATA::res

6.15.1.16 int GCR_DATA::restart = -1

6.15.1.17 double GCR_DATA::tol_abs = 1e-6

6.15.1.18 double GCR_DATA::tol_rel = 1e-6

6.15.1.19 int GCR_DATA::total_iter = 0

6.15.1.20 OPTRANS_DATA GCR_DATA::transpose_dat

6.15.1.21 std::vector<Matrix<double> > GCR_DATA::u

6.15.1.22 Matrix<double> GCR_DATA::u_temp

6.15.1.23 Matrix<double> GCR_DATA::x

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/lark.h

6.16 GMRESLP_DATA Struct Reference

`#include <lark.h>`

Public Attributes

- int restart = -1
- int maxit = 0
- int iter = 0
- int steps = 0
- double tol_rel = 1e-6
- double tol_abs = 1e-6
- double res
- double relres
- double relres_base
- double bestres
- bool Output = true
- Matrix< double > x
- Matrix< double > bestx
- Matrix< double > r
- ARNOLDI_DATA arnoldi_dat

6.16.1 Member Data Documentation

6.16.1.1 ARNOLDI_DATA GMRESLP_DATA::arnoldi_dat

6.16.1.2 double GMRESLP_DATA::bestres

6.16.1.3 Matrix<double> GMRESLP_DATA::bestx

6.16.1.4 int GMRESLP_DATA::iter = 0

6.16.1.5 int GMRESLP_DATA::maxit = 0

6.16.1.6 bool GMRESLP_DATA::Output = true

6.16.1.7 Matrix<double> GMRESLP_DATA::r

6.16.1.8 double GMRESLP_DATA::relres

6.16.1.9 double GMRESLP_DATA::relres_base

6.16.1.10 double GMRESLP_DATA::res

6.16.1.11 int GMRESLP_DATA::restart = -1

6.16.1.12 int GMRESLP_DATA::steps = 0

6.16.1.13 double GMRESLP_DATA::tol_abs = 1e-6

6.16.1.14 double GMRESLP_DATA::tol_rel = 1e-6

6.16.1.15 Matrix<double> GMRESLP_DATA::x

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/lark.h

6.17 GMRESR_DATA Struct Reference

`#include <lark.h>`

Public Attributes

- int gcr_restart = -1
- int gcr_maxit = 0
- int gmres_restart = -1
- int gmres_maxit = 1
- int N
- int total_iter
- int iter_outer
- int iter_inner
- bool GCR_Output = true
- bool GMRES_Output = false
- double gmres_tol = 0.1
- double gcr_rel_tol = 1e-6
- double gcr_abs_tol = 1e-6
- Matrix< double > arg
- GCR_DATA gcr_dat
- GMRESRP_DATA gmres_dat
- int(* matvec)(const Matrix< double > &x, Matrix< double > &Ax, const void *matvec_data)
- int(* terminal_precon)(const Matrix< double > &r, Matrix< double > &p, const void *precon_data)
- const void * matvec_data
- const void * term_precon

6.17.1 Member Data Documentation

6.17.1.1 Matrix<double> GMRESR_DATA::arg

6.17.1.2 double GMRESR_DATA::gcr_abs_tol = 1e-6

6.17.1.3 GCR_DATA GMRESR_DATA::gcr_dat

6.17.1.4 int GMRESR_DATA::gcr_maxit = 0

6.17.1.5 bool GMRESR_DATA::GCR_Output = true

6.17.1.6 double GMRESR_DATA::gcr_rel_tol = 1e-6

6.17.1.7 int GMRESR_DATA::gcr_restart = -1

6.17.1.8 GMRESRP_DATA GMRESR_DATA::gmres_dat

6.17.1.9 int GMRESR_DATA::gmres_maxit = 1

6.17.1.10 bool GMRESR_DATA::GMRES_Output = false

6.17.1.11 int GMRESR_DATA::gmres_restart = -1

6.17.1.12 double GMRESR_DATA::gmres_tol = 0.1

6.17.1.13 int GMRESR_DATA::iter_inner

6.17.1.14 int GMRESR_DATA::iter_outer

6.17.1.15 int(* GMRESR_DATA::matvec)(const Matrix< double > &x, Matrix< double > &Ax, const void *matvec_data)

6.17.1.16 const void* GMRESR_DATA::matvec_data

6.17.1.17 int GMRESR_DATA::N

6.17.1.18 const void* GMRESR_DATA::term_precon

6.17.1.19 int(* GMRESR_DATA::terminal_precon)(const Matrix< double > &r, Matrix< double > &p, const void *precon_data)

6.17.1.20 int GMRESR_DATA::total_iter

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/lark.h

6.18 GMRESRP_DATA Struct Reference

`#include <lark.h>`

Public Attributes

- int restart = -1

- int maxit = 0
- int iter_outer = 0
- int iter_inner = 0
- int iter_total = 0
- double tol_rel = 1e-6
- double tol_abs = 1e-6
- double res
- double relres
- double relres_base
- double bestres
- bool Output = true
- Matrix< double > x
- Matrix< double > bestx
- Matrix< double > r
- std::vector< Matrix< double > > Vk
- std::vector< std::vector < double > > H
- std::vector< std::vector < double > > H_bar
- std::vector< double > y
- std::vector< double > e0
- std::vector< double > e0_bar
- Matrix< double > w
- Matrix< double > v
- Matrix< double > sum

6.18.1 Member Data Documentation

6.18.1.1 double GMRESRP_DATA::bestres

6.18.1.2 Matrix<double> GMRESRP_DATA::bestx

6.18.1.3 std::vector< double > GMRESRP_DATA::e0

6.18.1.4 std::vector< double > GMRESRP_DATA::e0_bar

6.18.1.5 std::vector< std::vector< double > > GMRESRP_DATA::H

6.18.1.6 std::vector< std::vector< double > > GMRESRP_DATA::H_bar

6.18.1.7 int GMRESRP_DATA::iter_inner = 0

6.18.1.8 int GMRESRP_DATA::iter_outer = 0

6.18.1.9 int GMRESRP_DATA::iter_total = 0

6.18.1.10 int GMRESRP_DATA::maxit = 0

6.18.1.11 bool GMRESRP_DATA::Output = true

6.18.1.12 Matrix<double> GMRESRP_DATA::r

6.18.1.13 double GMRESRP_DATA::relres

6.18.1.14 double GMRESRP_DATA::relres_base

6.18.1.15 double GMRESRP_DATA::res

6.18.1.16 int GMRESRP_DATA::restart = -1

6.18.1.17 Matrix<double> GMRESRP_DATA::sum

6.18.1.18 double GMRESRP_DATA::tol_abs = 1e-6

6.18.1.19 double GMRESRP_DATA::tol_rel = 1e-6

6.18.1.20 Matrix<double> GMRESRP_DATA::v

6.18.1.21 std::vector< Matrix<double> > GMRESRP_DATA::Vk

6.18.1.22 Matrix<double> GMRESRP_DATA::w

6.18.1.23 Matrix<double> GMRESRP_DATA::x

6.18.1.24 std::vector< double > GMRESRP_DATA::y

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/lark.h

6.19 GPAST_DATA Struct Reference

`#include <magpie.h>`

Public Attributes

- double x
- double y
- double He
- double q
- std::vector< double > gama_inf
- double qo
- double Plo
- std::vector< double > po
- double poi
- bool present

6.19.1 Member Data Documentation

6.19.1.1 std::vector<double> GPAST_DATA::gama_inf

6.19.1.2 double GPAST_DATA::He

6.19.1.3 double GPAST_DATA::Plo

6.19.1.4 std::vector<double> GPAST_DATA::po

6.19.1.5 double GPAST_DATA::poi

6.19.1.6 bool GPAST_DATA::present

6.19.1.7 double GPAST_DATA::q

6.19.1.8 double GPAST_DATA::qo

6.19.1.9 double GPAST_DATA::x

6.19.1.10 double GPAST_DATA::y

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/magpie.h

6.20 GSTA_DATA Struct Reference

`#include <magpie.h>`

Public Attributes

- double qmax
- int m
- std::vector< double > dHo
- std::vector< double > dSo

6.20.1 Member Data Documentation

6.20.1.1 std::vector<double> GSTA_DATA::dHo

6.20.1.2 std::vector<double> GSTA_DATA::dSo

6.20.1.3 int GSTA_DATA::m

6.20.1.4 double GSTA_DATA::qmax

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/magpie.h

6.21 GSTA_OPT_DATA Struct Reference

`#include <gsta_opt.h>`

Public Attributes

- int total_eval
- int n_par
- double qmax
- int iso
- std::vector< std::vector < double > > Fobj

- std::vector< std::vector < double > > q
- std::vector< std::vector < double > > P
- std::vector< std::vector < double > > best_par
- std::vector< std::vector < double > > Kno
- std::vector< std::vector < std::vector< double > > > all_pars
- std::vector< std::vector < double > > norms
- std::vector< double > opt_qmax

6.21.1 Member Data Documentation

6.21.1.1 std::vector<std::vector<std::vector<double> > > GSTA_OPT_DATA::all_pars

6.21.1.2 std::vector<std::vector<double> > GSTA_OPT_DATA::best_par

6.21.1.3 std::vector<std::vector<double> > GSTA_OPT_DATA::Fobj

6.21.1.4 int GSTA_OPT_DATA::iso

6.21.1.5 std::vector<std::vector<double> > GSTA_OPT_DATA::Kno

6.21.1.6 int GSTA_OPT_DATA::n_par

6.21.1.7 std::vector<std::vector<double> > GSTA_OPT_DATA::norms

6.21.1.8 std::vector<double> GSTA_OPT_DATA::opt_qmax

6.21.1.9 std::vector<std::vector<double> > GSTA_OPT_DATA::P

6.21.1.10 std::vector<std::vector<double> > GSTA_OPT_DATA::q

6.21.1.11 double GSTA_OPT_DATA::qmax

6.21.1.12 int GSTA_OPT_DATA::total_eval

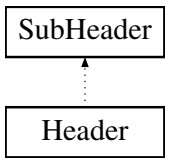
The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/gsta_opt.h

6.22 Header Class Reference

`#include <yaml_wrapper.h>`

Inheritance diagram for Header:



Public Member Functions

- Header ()
- ~Header ()
- Header (const Header &head)
- Header (std::string name)
- Header (const KeyValueMap &map)
- Header (std::string name, const KeyValueMap &map)
- Header (std::string key, const SubHeader &sub)
- Header & operator= (const Header &head)
- ValueTypePair & operator[] (const std::string key)
- ValueTypePair operator[] (const std::string key) const
- SubHeader & operator() (const std::string key)
- SubHeader operator() (const std::string key) const
- std::map< std::string, SubHeader > & getSubMap ()
- KeyValueMap & getDataMap ()
- SubHeader & getSubHeader (std::string key)
- std::map< std::string, SubHeader >::const_iterator end () const
- std::map< std::string, SubHeader >::iterator end ()
- std::map< std::string, SubHeader >::const_iterator begin () const
- std::map< std::string, SubHeader >::iterator begin ()
- void clear ()
- void resetKeys ()
- void changeKey (std::string oldKey, std::string newKey)
- void addPair (std::string key, std::string val)
- void addPair (std::string key, std::string val, int t)
- void setName (std::string name)
- void setAlias (std::string alias)
- void setNameAliasPair (std::string n, std::string a, int s)
- void setState (int state)
- void DisplayContents ()
- void addSubKey (std::string key)
- void copyAnchor2Alias (std::string alias, SubHeader &ref)
- int size ()
- std::string getName ()
- std::string getAlias ()
- int getState ()
- bool isAlias ()
- bool isAnchor ()
- SubHeader & getAnchoredSub (std::string alias)

Private Attributes

- std::map< std::string, SubHeader > Sub_Map

Additional Inherited Members

6.22.1 Constructor & Destructor Documentation

6.22.1.1 Header::Header ( )

6.22.1.2 Header::~Header ( )

6.22.1.3 Header::Header (const **Header** & *head*)

6.22.1.4 Header::Header (std::string *name*)

6.22.1.5 Header::Header (const **KeyValueMap** & *map*)

6.22.1.6 Header::Header (std::string *name,* const **KeyValueMap** & *map*)

6.22.1.7 Header::Header (std::string *key,* const **SubHeader** & *sub*)

6.22.2 Member Function Documentation

6.22.2.1 void Header::addPair (std::string *key,* std::string *val*)

6.22.2.2 void Header::addPair (std::string *key,* std::string *val,* int *t*)

6.22.2.3 void Header::addSubKey (std::string *key*)

6.22.2.4 std::map< std::string, **SubHeader** >::const_iterator Header::begin ( ) const

6.22.2.5 std::map< std::string, **SubHeader** >::iterator Header::begin ( )

6.22.2.6 void Header::changeKey (std::string *oldKey,* std::string *newKey*)

6.22.2.7 void Header::clear ( )

6.22.2.8 void Header::copyAnchor2Alias (std::string *alias,* **SubHeader** & *ref*)

6.22.2.9 void Header::DisplayContents ( )

6.22.2.10 std::map< std::string, **SubHeader** >::const_iterator Header::end ( ) const

6.22.2.11 std::map< std::string, **SubHeader** >::iterator Header::end ( )

6.22.2.12 std::string Header::getAlias ( )

6.22.2.13 **SubHeader** & Header::getAnchoredSub (std::string *alias*)

6.22.2.14 **KeyValueMap** & Header::getDataMap ( )

6.22.2.15 std::string Header::getName ( )

6.22.2.16 int Header::getState ( )

6.22.2.17 **SubHeader** & Header::getSubHeader (std::string *key*)

6.22.2.18 std::map< std::string, **SubHeader** > & Header::getSubMap ( )

6.22.2.19 bool Header::isAlias ( )

6.22.2.20 bool Header::isAnchor ( )

6.22.2.21 SubHeader & Header::operator() (const std::string *key*)

6.22.2.22 SubHeader Header::operator() (const std::string *key*) const

6.22.2.23 Header & Header::operator= (const Header & *head*)

6.22.2.24 ValueTypePair & Header::operator[] (const std::string *key*)

6.22.2.25 ValueTypePair Header::operator[] (const std::string *key*) const

6.22.2.26 void Header::resetKeys ( )

6.22.2.27 void Header::setAlias (std::string *alias*)

6.22.2.28 void Header::setName (std::string *name*)

6.22.2.29 void Header::setNameAliasPair (std::string *n,* std::string *a,* int *s*)

6.22.2.30 void Header::setState (int *state*)

6.22.2.31 int Header::size ( )

6.22.3 Member Data Documentation

6.22.3.1 std::map<std::string, SubHeader> Header::Sub_Map [private]

The documentation for this class was generated from the following files:

- /Users/aladshaw3/projects/ecosystem/include/yaml_wrapper.h
- /Users/aladshaw3/projects/ecosystem/src/yaml_wrapper.cpp

6.23 KeyValueMap Class Reference

`#include <yaml_wrapper.h>`

Public Member Functions

- KeyValueMap ()
- ~KeyValueMap ()
- KeyValueMap (const std::map< std::string, std::string > &map)
- KeyValueMap (std::string key, std::string value)
- KeyValueMap (const KeyValueMap &map)
- KeyValueMap & operator= (const KeyValueMap &map)
- ValueTypePair & operator[] (const std::string key)
- ValueTypePair operator[] (const std::string key) const
- std::map< std::string, ValueTypePair > & getMap ()
- std::map< std::string, ValueTypePair > ::const_iterator end () const

- std::map< std::string, ValueTypePair >::iterator end ()
- std::map< std::string, ValueTypePair > ::const_iterator begin () const
- std::map< std::string, ValueTypePair >::iterator begin ()
- void clear ()
- void addKey (std::string key)
- void editValue4Key (std::string val, std::string key)
- void editValue4Key (std::string val, int type, std::string key)
- void addPair (std::string key, ValueTypePair val)
- void addPair (std::string key, std::string val)
- void addPair (std::string key, std::string val, int type)
- void findType (std::string key)
- void assertType (std::string key, int type)
- void findAllTypes ()
- void DisplayMap ()
- int size ()
- std::string getString (std::string key)
- bool getBool (std::string key)
- double getDouble (std::string key)
- int getInt (std::string key)
- std::string getValue (std::string key)
- int getType (std::string key)
- ValueTypePair & getPair (std::string key)

Private Attributes

- std::map< std::string, ValueTypePair > Key_Value

6.23.1 Constructor & Destructor Documentation

6.23.1.1 KeyValueMap::KeyValueMap ( )

6.23.1.2 KeyValueMap::~KeyValueMap ( )

6.23.1.3 KeyValueMap::KeyValueMap (const std::map< std::string, std::string > & *map*)

6.23.1.4 KeyValueMap::KeyValueMap (std::string *key*, std::string *value*)

6.23.1.5 KeyValueMap::KeyValueMap (const KeyValueMap & *map*)

6.23.2 Member Function Documentation

6.23.2.1 void KeyValueMap::addKey (std::string *key*)

6.23.2.2 void KeyValueMap::addPair (std::string *key*, ValueTypePair *val*)

6.23.2.3 void KeyValueMap::addPair (std::string *key*, std::string *val*)

6.23.2.4 void KeyValueMap::addPair (std::string *key*, std::string *val*, int *type*)

6.23.2.5 void KeyValueMap::assertType (std::string *key,* int *type*)

6.23.2.6 std::map< std::string, **ValueTypePair** >::const_iterator KeyValueMap::begin ( ) const

6.23.2.7 std::map< std::string, **ValueTypePair** >::iterator KeyValueMap::begin ( )

6.23.2.8 void KeyValueMap::clear ( )

6.23.2.9 void KeyValueMap::DisplayMap ( )

6.23.2.10 void KeyValueMap::editValue4Key (std::string *val,* std::string *key*)

6.23.2.11 void KeyValueMap::editValue4Key (std::string *val,* int *type,* std::string *key*)

6.23.2.12 std::map< std::string, **ValueTypePair** >::const_iterator KeyValueMap::end ( ) const

6.23.2.13 std::map< std::string, **ValueTypePair** >::iterator KeyValueMap::end ( )

6.23.2.14 void KeyValueMap::findAllTypes ( )

6.23.2.15 void KeyValueMap::findType (std::string *key*)

6.23.2.16 bool KeyValueMap::getBool (std::string *key*)

6.23.2.17 double KeyValueMap::getDouble (std::string *key*)

6.23.2.18 int KeyValueMap::getInt (std::string *key*)

6.23.2.19 std::map< std::string, **ValueTypePair** > & KeyValueMap::getMap ( )

6.23.2.20 **ValueTypePair** & KeyValueMap::getPair (std::string *key*)

6.23.2.21 std::string KeyValueMap::getString (std::string *key*)

6.23.2.22 int KeyValueMap::getType (std::string *key*)

6.23.2.23 std::string KeyValueMap::getValue (std::string *key*)

6.23.2.24 **KeyValueMap** & KeyValueMap::operator= (const **KeyValueMap** & *map*)

6.23.2.25 **ValueTypePair** & KeyValueMap::operator[] (const std::string *key*)

6.23.2.26 **ValueTypePair** KeyValueMap::operator[] (const std::string *key*) const

6.23.2.27 int KeyValueMap::size ( )

6.23.3 Member Data Documentation

6.23.3.1 std::map<std::string, **ValueTypePair** > KeyValueMap::Key_Value [private]

The documentation for this class was generated from the following files:

- /Users/aladshaw3/projects/ecosystem/include/yaml_wrapper.h
- /Users/aladshaw3/projects/ecosystem/src/yaml_wrapper.cpp

6.24 lm_control_struct Struct Reference

`#include <lmmin.h>`

Public Attributes

- double ftol
- double xtol
- double gtol
- double epsilon
- double stepbound
- int maxcall
- int scale_diag
- int printflags

6.24.1 Detailed Description

Compact high-level interface.

6.24.2 Member Data Documentation

6.24.2.1 double lm_control_struct::epsilon

6.24.2.2 double lm_control_struct::ftol

6.24.2.3 double lm_control_struct::gtol

6.24.2.4 int lm_control_struct::maxcall

6.24.2.5 int lm_control_struct::printflags

6.24.2.6 int lm_control_struct::scale_diag

6.24.2.7 double lm_control_struct::stepbound

6.24.2.8 double lm_control_struct::xtol

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/lmmin.h

6.25 lm_status_struct Struct Reference

`#include <lmmin.h>`

Public Attributes

- double fnorm
- int nfev
- int info

6.25.1 Member Data Documentation

6.25.1.1 double lm_status_struct::fnorm

6.25.1.2 int lm_status_struct::info

6.25.1.3 int lm_status_struct::nfev

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/lmmin.h

6.26 lmcurve_data_struct Struct Reference

Public Attributes

- const double * t
- const double * y
- double(* f)(double t, const double *par)

6.26.1 Member Data Documentation

6.26.1.1 double(* lmcurve_data_struct::f)(double t, const double *par)

6.26.1.2 const double* lmcurve_data_struct::t

6.26.1.3 const double* lmcurve_data_struct::y

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/src/lmcurve.c

6.27 MAGPIE_DATA Struct Reference

```
#include <magpie.h>
```

Public Attributes

- std::vector< GSTA_DATA > gsta_dat
- std::vector< mSPD_DATA > mspd_dat
- std::vector< GPAST_DATA > gpast_dat
- SYSTEM_DATA sys_dat

6.27.1 Member Data Documentation

6.27.1.1 std::vector<GPAST_DATA> MAGPIE_DATA::gpast_dat

6.27.1.2 std::vector<GSTA_DATA> MAGPIE_DATA::gsta_dat

6.27.1.3 std::vector<mSPD_DATA> MAGPIE_DATA::mspd_dat

6.27.1.4 SYSTEM_DATA MAGPIE_DATA::sys_dat

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/magpie.h

6.28 MassBalance Class Reference

`#include <shark.h>`

Public Member Functions

- MassBalance ()
- ~MassBalance ()
- void Initialize_List (MasterSpeciesList &List)
- void Display_Info ()
- void Set_Delta (int i, double v)
- void Set_TotalConcentration (double v)
- void Set_Name (std::string name)
- double Get_Delta (int i)
- double Sum_Delta ()
- double Get_TotalConcentration ()
- std::string Get_Name ()
- double Eval_Residual (const Matrix< double > &x)

Protected Attributes

- MasterSpeciesList * List
- std::vector< double > Delta
- double TotalConcentration

Private Attributes

- std::string Name

6.28.1 Constructor & Destructor Documentation

6.28.1.1 MassBalance::MassBalance ( )

6.28.1.2 MassBalance::~MassBalance ( )

6.28.2 Member Function Documentation

6.28.2.1 void MassBalance::Display_Info ( )

6.28.2.2 double MassBalance::Eval_Residual (const Matrix< double > & *x*)

6.28.2.3 double MassBalance::Get_Delta (int *i*)

6.28.2.4 std::string MassBalance::Get_Name ( )

6.28.2.5 double MassBalance::Get_TotalConcentration ( )

6.28.2.6 void MassBalance::Initialize_List (MasterSpeciesList & *List*)

6.28.2.7 void MassBalance::Set_Delta (int *i*, double *v*)

6.28.2.8 void MassBalance::Set_Name (std::string *name*)

6.28.2.9 void MassBalance::Set_TotalConcentration (double *v*)

6.28.2.10 double MassBalance::Sum_Delta ( )

6.28.3 Member Data Documentation

6.28.3.1 std::vector<double> MassBalance::Delta [protected]

6.28.3.2 MasterSpeciesList* MassBalance::List [protected]

6.28.3.3 std::string MassBalance::Name [private]

6.28.3.4 double MassBalance::TotalConcentration [protected]

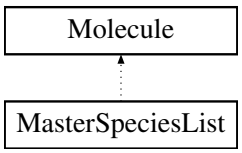
The documentation for this class was generated from the following files:

- /Users/aladshaw3/projects/ecosystem/include/shark.h
- /Users/aladshaw3/projects/ecosystem/src/shark.cpp

6.29 MasterSpeciesList Class Reference

`#include <shark.h>`

Inheritance diagram for MasterSpeciesList:



Public Member Functions

- MasterSpeciesList ()
- ~MasterSpeciesList ()
- MasterSpeciesList (const MasterSpeciesList &msl)
- MasterSpeciesList & operator= (const MasterSpeciesList &msl)
- void set_list_size (int i)
- void set_species (int i, std::string formula)
- void set_species (int i, int charge, double enthalpy, double entropy, double energy, bool HS, bool G, std::string Phase, std::string Name, std::string Formula, std::string lin_formula)
- void DisplayInfo (int i)
- void DisplayAll ()
- void DisplayConcentrations (Matrix< double > &C)
- void set_alkalinity (double alk)
- int list_size ()

- Molecule & get_species (int i)
- int get_index (std::string name)
- double charge (int i)
- double alkalinity ()
- std::string speciesName (int i)
- double Eval_ChargeResidual (const Matrix< double > &x)

Protected Attributes

- int size
- std::vector< Molecule > species
- double residual_alkalinity

Additional Inherited Members

6.29.1 Constructor & Destructor Documentation

6.29.1.1 MasterSpeciesList::MasterSpeciesList ( )

6.29.1.2 MasterSpeciesList::~MasterSpeciesList ( )

6.29.1.3 MasterSpeciesList::MasterSpeciesList (const MasterSpeciesList & *msl*)

6.29.2 Member Function Documentation

6.29.2.1 double MasterSpeciesList::alkalinity ( )

6.29.2.2 double MasterSpeciesList::charge (int *i*)

6.29.2.3 void MasterSpeciesList::DisplayAll ( )

6.29.2.4 void MasterSpeciesList::DisplayConcentrations (Matrix< double > & *C*)

6.29.2.5 void MasterSpeciesList::DisplayInfo (int *i*)

6.29.2.6 double MasterSpeciesList::Eval_ChargeResidual (const Matrix< double > & *x*)

6.29.2.7 int MasterSpeciesList::get_index (std::string *name*)

6.29.2.8 Molecule & MasterSpeciesList::get_species (int *i*)

6.29.2.9 int MasterSpeciesList::list_size ( )

6.29.2.10 MasterSpeciesList & MasterSpeciesList::operator= (const MasterSpeciesList & *msl*)

6.29.2.11 void MasterSpeciesList::set_alkalinity (double *alk*)

6.29.2.12 void MasterSpeciesList::set_list_size (int *i*)

6.29.2.13 void MasterSpeciesList::set_species (int *i,* std::string *formula*)

6.29.2.14 void MasterSpeciesList::set_species (int *i,* int *charge,* double *enthalpy,* double *entropy,* double *energy,* bool *HS,* bool *G,* std::string *Phase,* std::string *Name,* std::string *Formula,* std::string *lin_formula*)

6.29.2.15 std::string MasterSpeciesList::speciesName (int *i*)

6.29.3 Member Data Documentation

6.29.3.1 double MasterSpeciesList::residual_alkalinity [protected]

6.29.3.2 int MasterSpeciesList::size [protected]

6.29.3.3 std::vector<Molecule> MasterSpeciesList::species [protected]

The documentation for this class was generated from the following files:

- /Users/aladshaw3/projects/ecosystem/include/shark.h
- /Users/aladshaw3/projects/ecosystem/src/shark.cpp

6.30 Matrix< T > Class Template Reference

`#include <macaw.h>`

Public Member Functions

- Matrix (int rows, int columns)
- T & operator() (int i, int j)
- T operator() (int i, int j) const
- Matrix (const Matrix &M)
- Matrix & operator= (const Matrix &M)
- Matrix ()
- ~Matrix ()
- void set_size (int i, int j)
- void zeros ()
- void edit (int i, int j, T value)
- int rows ()
- int columns ()
- T determinate ()
- T norm ()
- T sum ()
- T inner_product (const Matrix &x)
- Matrix & cofactor (const Matrix &M)
- Matrix operator+ (const Matrix &M)
- Matrix operator- (const Matrix &M)
- Matrix operator* (const T)
- Matrix operator/ (const T)
- Matrix operator* (const Matrix &M)
- Matrix & transpose (const Matrix &M)
- Matrix & transpose_multiply (const Matrix &MT, const Matrix &v)
- Matrix & adjoint (const Matrix &M)
- Matrix & inverse (const Matrix &M)
- void Display (const std::string Name)
- Matrix & tridiagonalSolve (const Matrix &A, const Matrix &b)
- Matrix & ladshawSolve (const Matrix &A, const Matrix &d)
- Matrix & tridiagonalFill (const T A, const T B, const T C, bool Spherical)
- Matrix & naturalLaplacian3D (int m)
- Matrix & sphericalBCFill (int node, const T coeff, T variable)

- Matrix & ConstantICFill (const T IC)
- Matrix & SolnTransform (const Matrix &A, bool Forward)
- T sphericalAvg (double radius, double dr, double bound, bool Dirichlet)
- T IntegralAvg (double radius, double dr, double bound, bool Dirichlet)
- T IntegralTotal (double dr, double bound, bool Dirichlet)
- Matrix & tridiagonalVectorFill (const std::vector< T > &A, const std::vector< T > &B, const std::vector< T > &C)
- Matrix & columnVectorFill (const std::vector< T > &A)
- Matrix & columnProjection (const Matrix &b, const Matrix &b_old, const double dt, const double dt_old)
- Matrix & dirichletBCFill (int node, const T coeff, T variable)
- Matrix & diagonalSolve (const Matrix &D, const Matrix &v)
- Matrix & upperTriangularSolve (const Matrix &U, const Matrix &v)
- Matrix & lowerTriangularSolve (const Matrix &L, const Matrix &v)
- Matrix & upperHessenberg2Triangular (Matrix &b)
- Matrix & lowerHessenberg2Triangular (Matrix &b)
- Matrix & upperHessenbergSolve (const Matrix &H, const Matrix &v)
- Matrix & lowerHessenbergSolve (const Matrix &H, const Matrix &v)
- Matrix & columnExtract (int j, const Matrix &M)
- Matrix & rowExtract (int i, const Matrix &M)
- Matrix & columnReplace (int j, const Matrix &v)
- Matrix & rowReplace (int i, const Matrix &v)
- void rowShrink ()
- void columnShrink ()
- void rowExtend (const Matrix &v)
- void columnExtend (const Matrix &v)

Protected Attributes

- int num_rows
- int num_cols
- std::vector< T > Data

6.30.1 Constructor & Destructor Documentation

6.30.1.1 template<class T > Matrix< T >::Matrix (int *rows,* int *columns*)

6.30.1.2 template<class T > Matrix< T >::Matrix (const Matrix< T > & *M*)

6.30.1.3 template<class T > Matrix< T >::Matrix ( )

6.30.1.4 template<class T > Matrix< T >::~Matrix ( )

6.30.2 Member Function Documentation

6.30.2.1 template<class T > Matrix< T > & Matrix< T >::adjoint (const Matrix< T > & *M*)

6.30.2.2 template<class T > Matrix< T > & Matrix< T >::cofactor (const Matrix< T > & *M*)

6.30.2.3 template<class T > void Matrix< T >::columnExtend (const Matrix< T > & *v*)

6.30.2.4 template<class T > Matrix< T > & Matrix< T >::columnExtract (int *j,* const Matrix< T > & *M*)

6.30.2.5 template<class T > Matrix< T > & Matrix< T >::columnProjection (const Matrix< T > & *b,* const Matrix< T > & *b_old,* const double *dt,* const double *dt_old*)

6.30.2.6 template<class T > Matrix< T > & Matrix< T >::columnReplace (int *j,* const Matrix< T > & *v*)

6.30.2.7 template<class T > int Matrix< T >::columns ( )

6.30.2.8 template<class T > void Matrix< T >::columnShrink ( )

6.30.2.9 template<class T> Matrix< T > & Matrix< T >::columnVectorFill (const std::vector< T > & *A*)

6.30.2.10 template<class T> Matrix< T > & Matrix< T >::ConstantICFill (const T *IC*)

6.30.2.11 template<class T > T Matrix< T >::determinate ( )

6.30.2.12 template<class T > Matrix< T > & Matrix< T >::diagonalSolve (const Matrix< T > & *D,* const Matrix< T > & *v*)

6.30.2.13 template<class T> Matrix< T > & Matrix< T >::dirichletBCFill (int *node,* const T *coeff,* T *variable*)

6.30.2.14 template<class T > void Matrix< T >::Display (const std::string *Name*)

6.30.2.15 template<class T> void Matrix< T >::edit (int *i,* int *j,* T *value*)

6.30.2.16 template<class T > T Matrix< T >::inner_product (const Matrix< T > & *x*)

6.30.2.17 template<class T > T Matrix< T >::IntegralAvg (double *radius,* double *dr,* double *bound,* bool *Dirichlet*)

6.30.2.18 template<class T > T Matrix< T >::IntegralTotal (double *dr,* double *bound,* bool *Dirichlet*)

6.30.2.19 template<class T > Matrix< T > & Matrix< T >::inverse (const Matrix< T > & *M*)

6.30.2.20 template<class T > Matrix< T > & Matrix< T >::ladshawSolve (const Matrix< T > & *A,* const Matrix< T > & *d*)

6.30.2.21 template<class T > Matrix< T > & Matrix< T >::lowerHessenberg2Triangular (Matrix< T > & *b*)

6.30.2.22 template<class T > Matrix< T > & Matrix< T >::lowerHessenbergSolve (const Matrix< T > & *H,* const Matrix< T > & *v*)

6.30.2.23 template<class T > Matrix< T > & Matrix< T >::lowerTriangularSolve (const Matrix< T > & *L,* const Matrix< T > & *v*)

6.30.2.24 template<class T > Matrix< T > & Matrix< T >::naturalLaplacian3D (int *m*)

6.30.2.25 template<class T > T Matrix< T >::norm ( )

6.30.2.26 template<class T > T & Matrix< T >::operator() (int *i,* int *j*)

6.30.2.27 template<class T > T Matrix< T >::operator() (int *i,* int *j*) const

6.30.2.28 template<class T> Matrix< T > Matrix< T >::operator* (const T *a*)

6.30.2.29 template<class T> Matrix< T > Matrix< T >::operator* (const Matrix< T > & *M*)

6.30.2.30 template<class T > Matrix< T > Matrix< T >::operator+ (const Matrix< T > & *M*)

6.30.2.31 template<class T > Matrix< T > Matrix< T >::operator- (const Matrix< T > & *M*)

6.30.2.32 template<class T> Matrix< T > Matrix< T >::operator/ (const T *a*)

6.30.2.33 template<class T > Matrix< T > & Matrix< T >::operator= (const Matrix< T > & *M*)

6.30.2.34 template<class T > void Matrix< T >::rowExtend (const Matrix< T > & *v*)

6.30.2.35 template<class T > Matrix< T > & Matrix< T >::rowExtract (int *i,* const Matrix< T > & *M*)

6.30.2.36 template<class T > Matrix< T > & Matrix< T >::rowReplace (int *i,* const Matrix< T > & *v*)

6.30.2.37 template<class T > int Matrix< T >::rows ( )

6.30.2.38 template<class T > void Matrix< T >::rowShrink ( )

6.30.2.39 template<class T > void Matrix< T >::set_size (int *i,* int *j*)

6.30.2.40 template<class T > Matrix< T > & Matrix< T >::SolnTransform (const Matrix< T > & *A,* bool *Forward*)

6.30.2.41 template<class T > T Matrix< T >::sphericalAvg (double *radius,* double *dr,* double *bound,* bool *Dirichlet*)

6.30.2.42 template<class T> Matrix< T > & Matrix< T >::sphericalBCFill (int *node,* const T *coeff,* T *variable*)

6.30.2.43 template<class T > T Matrix< T >::sum ( )

6.30.2.44 template<class T > Matrix< T > & Matrix< T >::transpose (const Matrix< T > & *M*)

6.30.2.45 template<class T > Matrix< T > & Matrix< T >::transpose_multiply (const Matrix< T > & *MT,* const Matrix< T > & *v*)

6.30.2.46 template<class T> Matrix< T > & Matrix< T >::tridiagonalFill (const T *A,* const T *B,* const T *C,* bool *Spherical*)

6.30.2.47 template<class T > Matrix< T > & Matrix< T >::tridiagonalSolve (const Matrix< T > & *A,* const Matrix< T > & *b*)

6.30.2.48 template<class T> Matrix< T > & Matrix< T >::tridiagonalVectorFill (const std::vector< T > & *A,* const std::vector< T > & *B,* const std::vector< T > & *C*)

6.30.2.49 template<class T > Matrix< T > & Matrix< T >::upperHessenberg2Triangular (Matrix< T > & *b*)

6.30.2.50 template<class T > Matrix< T > & Matrix< T >::upperHessenbergSolve (const Matrix< T > & *H,* const Matrix< T > & *v*)

6.30.2.51 template<class T > Matrix< T > & Matrix< T >::upperTriangularSolve (const Matrix< T > & *U,* const Matrix< T > & *v*)

6.30.2.52 template<class T > void Matrix< T >::zeros ( )

6.30.3 Member Data Documentation

6.30.3.1 template<class T> std::vector<T> Matrix< T >::Data [protected]

6.30.3.2 template<class T> int Matrix< T >::num_cols [protected]

6.30.3.3 template<class T> int Matrix< T >::num_rows [protected]

The documentation for this class was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/macaw.h

6.31 Mechanism Class Reference

`#include <shark.h>`

Protected Attributes

- MasterSpeciesList * List
- std::vector< UnsteadyReaction > reactions
- std::vector< double > weight
- int species_index

6.31.1 Member Data Documentation

6.31.1.1 MasterSpeciesList* Mechanism::List [protected]

6.31.1.2 std::vector<UnsteadyReaction> Mechanism::reactions [protected]

6.31.1.3 int Mechanism::species_index [protected]

6.31.1.4 std::vector<double> Mechanism::weight [protected]

The documentation for this class was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/shark.h

6.32 MIXED_GAS Struct Reference

`#include <egret.h>`

Public Attributes

- int N
- bool CheckMolefractions = true
- double total_pressure
- double gas_temperature
- double velocity
- double char_length
- std::vector< double > molefraction
- double total_density
- double total_dyn_vis
- double kinematic_viscosity
- double total_molecular_weight
- double total_specific_heat
- double Reynolds
- Matrix< double > binary_diffusion
- std::vector< PURE_GAS > species_dat

6.32.1 Member Data Documentation

6.32.1.1 Matrix<double> MIXED_GAS::binary_diffusion

6.32.1.2 double MIXED_GAS::char_length

6.32.1.3 bool MIXED_GAS::CheckMolefractions = true

6.32.1.4 double MIXED_GAS::gas_temperature

6.32.1.5 double MIXED_GAS::kinematic_viscosity

6.32.1.6 std::vector<double> MIXED_GAS::molefraction

6.32.1.7 int MIXED_GAS::N

6.32.1.8 double MIXED_GAS::Reynolds

6.32.1.9 std::vector<PURE_GAS> MIXED_GAS::species_dat

6.32.1.10 double MIXED_GAS::total_density

6.32.1.11 double MIXED_GAS::total_dyn_vis

6.32.1.12 double MIXED_GAS::total_molecular_weight

6.32.1.13 double MIXED_GAS::total_pressure

6.32.1.14 double MIXED_GAS::total_specific_heat

6.32.1.15 double MIXED_GAS::velocity

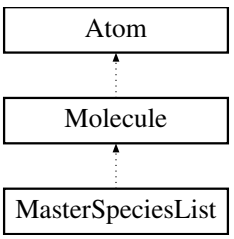
The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/egret.h

6.33 Molecule Class Reference

`#include <mola.h>`

Inheritance diagram for Molecule:



Public Member Functions

- Molecule ()
- ~Molecule ()

- Molecule (int charge, double enthalpy, double entropy, double energy, bool HS, bool G, std::string Phase, std::string Name, std::string Formula, std::string lin_formula)
- void Register (int charge, double enthalpy, double entropy, double energy, bool HS, bool G, std::string Phase, std::string Name, std::string Formula, std::string lin_formula)
- void Register (std::string formula)
- void setFormula (std::string form)
- void recalculateMolarWeight ()
- void setMolarWeigth (double mw)
- void editCharge (int c)
- void editOneOxidationState (int state, std::string Symbol)
- void editAllOxidationStates (int state, std::string Symbol)
- void calculateAvgOxiState (std::string Symbol)
- void editEnthalpy (double enthalpy)
- void editEntropy (double entropy)
- void editHS (double H, double S)
- void editEnergy (double energy)
- void removeOneAtom (std::string Symbol)
- void removeAllAtoms (std::string Symbol)
- int Charge ()
- double MolarWeight ()
- bool HaveHS ()
- bool HaveEnergy ()
- bool isRegistered ()
- double Enthalpy ()
- double Entropy ()
- double Energy ()
- std::string MoleculeName ()
- std::string MolecularFormula ()
- std::string MoleculePhase ()
- void DisplayInfo ()

Protected Attributes

- int charge
- double molar_weight
- double formation_enthalpy
- double formation_entropy
- double formation_energy
- std::string Phase
- std::vector< Atom > atoms

Private Attributes

- std::string Name
- std::string Formula
- bool haveG
- bool haveHS
- bool registered

Additional Inherited Members

6.33.1 Constructor & Destructor Documentation

6.33.1.1 Molecule::Molecule ( )

6.33.1.2 Molecule::∼Molecule ( )

6.33.1.3 Molecule::Molecule (int *charge,* double *enthalpy,* double *entropy,* double *energy,* bool *HS,* bool *G,* std::string *Phase,* std::string *Name,* std::string *Formula,* std::string *lin_formula*)

6.33.2 Member Function Documentation

6.33.2.1 void Molecule::calculateAvgOxiState (std::string *Symbol*)

6.33.2.2 int Molecule::Charge ( )

6.33.2.3 void Molecule::DisplayInfo ( )

6.33.2.4 void Molecule::editAllOxidationStates (int *state,* std::string *Symbol*)

6.33.2.5 void Molecule::editCharge (int *c*)

6.33.2.6 void Molecule::editEnergy (double *energy*)

6.33.2.7 void Molecule::editEnthalpy (double *enthalpy*)

6.33.2.8 void Molecule::editEntropy (double *entropy*)

6.33.2.9 void Molecule::editHS (double *H,* double *S*)

6.33.2.10 void Molecule::editOneOxidationState (int *state,* std::string *Symbol*)

6.33.2.11 double Molecule::Energy ( )

6.33.2.12 double Molecule::Enthalpy ( )

6.33.2.13 double Molecule::Entropy ( )

6.33.2.14 bool Molecule::HaveEnergy ( )

6.33.2.15 bool Molecule::HaveHS ( )

6.33.2.16 bool Molecule::isRegistered ( )

6.33.2.17 double Molecule::MolarWeight ( )

6.33.2.18 std::string Molecule::MolecularFormula ( )

6.33.2.19 std::string Molecule::MoleculeName ( )

6.33.2.20 std::string Molecule::MoleculePhase ( )

6.33.2.21 void Molecule::recalculateMolarWeight ( )

6.33.2.22 void Molecule::Register (int *charge,* double *enthalpy,* double *entropy,* double *energy,* bool *HS,* bool *G,* std::string *Phase,* std::string *Name,* std::string *Formula,* std::string *lin_formula*)

6.33.2.23 void Molecule::Register (std::string *formula*)

6.33.2.24 void Molecule::removeAllAtoms (std::string *Symbol*)

6.33.2.25 void Molecule::removeOneAtom (std::string *Symbol*)

6.33.2.26 void Molecule::setFormula (std::string *form*)

6.33.2.27 void Molecule::setMolarWeigth (double *mw*)

6.33.3 Member Data Documentation

6.33.3.1 std::vector<Atom> Molecule::atoms [protected]

6.33.3.2 int Molecule::charge [protected]

6.33.3.3 double Molecule::formation_energy [protected]

6.33.3.4 double Molecule::formation_enthalpy [protected]

6.33.3.5 double Molecule::formation_entropy [protected]

6.33.3.6 std::string Molecule::Formula [private]

6.33.3.7 bool Molecule::haveG [private]

6.33.3.8 bool Molecule::haveHS [private]

6.33.3.9 double Molecule::molar_weight [protected]

6.33.3.10 std::string Molecule::Name [private]

6.33.3.11 std::string Molecule::Phase [protected]

6.33.3.12 bool Molecule::registered [private]

The documentation for this class was generated from the following files:

- /Users/aladshaw3/projects/ecosystem/include/mola.h
- /Users/aladshaw3/projects/ecosystem/src/mola.cpp

6.34 MONKFISH_DATA Struct Reference

`#include <monkfish.h>`

Public Attributes

- unsigned long int total_steps = 0
- double time_old = 0.0
- double time = 0.0
- bool Print2File = true

- bool Print2Console = true
- bool DirichletBC = true
- bool NonLinear = false
- bool haveMinMax = false
- bool MultiScale = true
- int level = 2
- double t_counter = 0.0
- double t_print
- int NumComp
- double end_time
- double total_sorption_old
- double total_sorption
- double single_fiber_density
- double avg_fiber_density
- double max_fiber_density
- double min_fiber_density
- double max_porosity
- double min_porosity
- double domain_diameter
- FILE * Output
- double(* eval_eps)(int i, int l, const void *user_data)
- double(* eval_rho)(int i, int l, const void *user_data)
- double(* eval_Dex)(int i, int l, const void *user_data)
- double(* eval_ads)(int i, int l, const void *user_data)
- double(* eval_Ret)(int i, int l, const void *user_data)
- double(* eval_Cex)(int i, const void *user_data)
- double(* eval_kf)(int i, const void *user_data)
- const void * user_data
- std::vector< FINCH_DATA > finch_dat
- std::vector< MONKFISH_PARAM > param_dat
- std::vector< DOGFISH_DATA > dog_dat

6.34.1 Member Data Documentation

6.34.1.1 double MONKFISH_DATA::avg_fiber_density

6.34.1.2 bool MONKFISH_DATA::DirichletBC = true

6.34.1.3 std::vector<DOGFISH_DATA> MONKFISH_DATA::dog_dat

6.34.1.4 double MONKFISH_DATA::domain_diameter

6.34.1.5 double MONKFISH_DATA::end_time

6.34.1.6 double(* MONKFISH_DATA::eval_ads)(int i, int l, const void *user_data)

6.34.1.7 double(* MONKFISH_DATA::eval_Cex)(int i, const void *user_data)

6.34.1.8 double(* MONKFISH_DATA::eval_Dex)(int i, int l, const void *user_data)

6.34.1.9 double(* MONKFISH_DATA::eval_eps)(int i, int l, const void *user_data)

6.34.1.10 double(* MONKFISH_DATA::eval_kf)(int i, const void *user_data)

6.34.1.11 double(* MONKFISH_DATA::eval_Ret)(int i, int l, const void *user_data)

6.34.1.12 double(* MONKFISH_DATA::eval_rho)(int i, int l, const void *user_data)

6.34.1.13 std::vector<FINCH_DATA> MONKFISH_DATA::finch_dat

6.34.1.14 bool MONKFISH_DATA::haveMinMax = false

6.34.1.15 int MONKFISH_DATA::level = 2

6.34.1.16 double MONKFISH_DATA::max_fiber_density

6.34.1.17 double MONKFISH_DATA::max_porosity

6.34.1.18 double MONKFISH_DATA::min_fiber_density

6.34.1.19 double MONKFISH_DATA::min_porosity

6.34.1.20 bool MONKFISH_DATA::MultiScale = true

6.34.1.21 bool MONKFISH_DATA::NonLinear = false

6.34.1.22 int MONKFISH_DATA::NumComp

6.34.1.23 FILE* MONKFISH_DATA::Output

6.34.1.24 std::vector<MONKFISH_PARAM> MONKFISH_DATA::param_dat

6.34.1.25 bool MONKFISH_DATA::Print2Console = true

6.34.1.26 bool MONKFISH_DATA::Print2File = true

6.34.1.27 double MONKFISH_DATA::single_fiber_density

6.34.1.28 double MONKFISH_DATA::t_counter = 0.0

6.34.1.29 double MONKFISH_DATA::t_print

6.34.1.30 double MONKFISH_DATA::time = 0.0

6.34.1.31 double MONKFISH_DATA::time_old = 0.0

6.34.1.32 double MONKFISH_DATA::total_sorption

6.34.1.33 double MONKFISH_DATA::total_sorption_old

6.34.1.34 unsigned long int MONKFISH_DATA::total_steps = 0

6.34.1.35 const void* MONKFISH_DATA::user_data

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/monkfish.h

6.35 MONKFISH_PARAM Struct Reference

`#include <monkfish.h>`

Public Attributes

- double interparticle_diffusion
- double exterior_concentration
- double exterior_transfer_coeff
- double sorbed_molefraction
- double initial_sorption
- double sorption_bc
- double intraparticle_diffusion
- double film_transfer_coeff
- Matrix< double > avg_sorption
- Matrix< double > avg_sorption_old
- Molecule species

6.35.1 Member Data Documentation

6.35.1.1 Matrix<double> MONKFISH_PARAM::avg_sorption

6.35.1.2 Matrix<double> MONKFISH_PARAM::avg_sorption_old

6.35.1.3 double MONKFISH_PARAM::exterior_concentration

6.35.1.4 double MONKFISH_PARAM::exterior_transfer_coeff

6.35.1.5 double MONKFISH_PARAM::film_transfer_coeff

6.35.1.6 double MONKFISH_PARAM::initial_sorption

6.35.1.7 double MONKFISH_PARAM::interparticle_diffusion

6.35.1.8 double MONKFISH_PARAM::intraparticle_diffusion

6.35.1.9 double MONKFISH_PARAM::sorbed_molefraction

6.35.1.10 double MONKFISH_PARAM::sorption_bc

6.35.1.11 Molecule MONKFISH_PARAM::species

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/monkfish.h

6.36 mSPD_DATA Struct Reference

`#include <magpie.h>`

Public Attributes

- double s
- double v
- double eMax
- std::vector< double > eta
- double gama

6.36.1 Member Data Documentation

6.36.1.1 double mSPD_DATA::eMax

6.36.1.2 std::vector<double> mSPD_DATA::eta

6.36.1.3 double mSPD_DATA::gama

6.36.1.4 double mSPD_DATA::s

6.36.1.5 double mSPD_DATA::v

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/magpie.h

6.37 NUM_JAC_DATA Struct Reference

`#include <lark.h>`

Public Attributes

- double eps = sqrt(DBL_EPSILON)
- Matrix< double > Fx
- Matrix< double > Fxp
- Matrix< double > dxj

6.37.1 Member Data Documentation

6.37.1.1 Matrix<double> NUM_JAC_DATA::dxj

6.37.1.2 double NUM_JAC_DATA::eps = sqrt(DBL_EPSILON)

6.37.1.3 Matrix<double> NUM_JAC_DATA::Fx

6.37.1.4 Matrix<double> NUM_JAC_DATA::Fxp

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/lark.h

6.38 OPTRANS_DATA Struct Reference

`#include <lark.h>`

Public Attributes

- Matrix< double > li
- Matrix< double > Ai

6.38.1 Member Data Documentation

6.38.1.1 Matrix<double> OPTRANS_DATA::Ai

6.38.1.2 Matrix<double> OPTRANS_DATA::li

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/lark.h

6.39 PCG_DATA Struct Reference

```
#include <lark.h>
```

Public Attributes

- int maxit = 0
- int iter = 0
- double alpha
- double beta
- double tol_rel = 1e-6
- double tol_abs = 1e-6
- double res
- double relres
- double relres_base
- double bestres
- bool Output = true
- Matrix< double > x
- Matrix< double > bestx
- Matrix< double > r
- Matrix< double > r_old
- Matrix< double > z
- Matrix< double > z_old
- Matrix< double > p
- Matrix< double > Ap

6.39.1 Member Data Documentation

6.39.1.1 double PCG_DATA::alpha

6.39.1.2 Matrix<double> PCG_DATA::Ap

6.39.1.3 double PCG_DATA::bestres

6.39.1.4 Matrix<double> PCG_DATA::bestx

6.39.1.5 double PCG_DATA::beta

6.39.1.6 int PCG_DATA::iter = 0

6.39.1.7 int PCG_DATA::maxit = 0

6.39.1.8 bool PCG_DATA::Output = true

6.39.1.9 Matrix<double> PCG_DATA::p

6.39.1.10 Matrix<double> PCG_DATA::r

6.39.1.11 Matrix<double> PCG_DATA::r_old

6.39.1.12 double PCG_DATA::relres

6.39.1.13 double PCG_DATA::relres_base

6.39.1.14 double PCG_DATA::res

6.39.1.15 double PCG_DATA::tol_abs = 1e-6

6.39.1.16 double PCG_DATA::tol_rel = 1e-6

6.39.1.17 Matrix<double> PCG_DATA::x

6.39.1.18 Matrix<double> PCG_DATA::z

6.39.1.19 Matrix<double> PCG_DATA::z_old

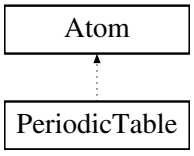
The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/lark.h

6.40 PeriodicTable Class Reference

`#include <eel.h>`

Inheritance diagram for PeriodicTable:



Public Member Functions

- PeriodicTable ()
- ~PeriodicTable ()
- PeriodicTable (int *n, int N)
- PeriodicTable (std::vector< std::string > &Symbol)
- PeriodicTable (std::vector< int > &n)
- void DisplayTable ()

Protected Attributes

- std::vector< Atom > Table

Private Attributes

- int number_elements

Additional Inherited Members

6.40.1 Constructor & Destructor Documentation

6.40.1.1 PeriodicTable::PeriodicTable ( )

6.40.1.2 PeriodicTable::~PeriodicTable ( )

6.40.1.3 PeriodicTable::PeriodicTable (int * *n*, int *N*)

6.40.1.4 PeriodicTable::PeriodicTable (std::vector< std::string > & *Symbol*)

6.40.1.5 PeriodicTable::PeriodicTable (std::vector< int > & *n*)

6.40.2 Member Function Documentation

6.40.2.1 void PeriodicTable::DisplayTable ( )

6.40.3 Member Data Documentation

6.40.3.1 int PeriodicTable::number_elements [private]

6.40.3.2 std::vector<Atom> PeriodicTable::Table [protected]

The documentation for this class was generated from the following files:

- /Users/aladshaw3/projects/ecosystem/include/eel.h
- /Users/aladshaw3/projects/ecosystem/src/eel.cpp

6.41 PICARD_DATA Struct Reference

`#include <lark.h>`

Public Attributes

- int maxit = 0
- int iter = 0
- double tol_rel = 1e-6
- double tol_abs = 1e-6
- double res
- double relres
- double relres_base
- double bestres
- bool Output = true

- Matrix< double > x0
- Matrix< double > bestx
- Matrix< double > r

6.41.1 Member Data Documentation

6.41.1.1 double PICARD_DATA::bestres

6.41.1.2 Matrix<double> PICARD_DATA::bestx

6.41.1.3 int PICARD_DATA::iter = 0

6.41.1.4 int PICARD_DATA::maxit = 0

6.41.1.5 bool PICARD_DATA::Output = true

6.41.1.6 Matrix<double> PICARD_DATA::r

6.41.1.7 double PICARD_DATA::relres

6.41.1.8 double PICARD_DATA::relres_base

6.41.1.9 double PICARD_DATA::res

6.41.1.10 double PICARD_DATA::tol_abs = 1e-6

6.41.1.11 double PICARD_DATA::tol_rel = 1e-6

6.41.1.12 Matrix<double> PICARD_DATA::x0

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/lark.h

6.42 PJFNK_DATA Struct Reference

`#include <lark.h>`

Public Attributes

- int nl_iter = 0
- int l_iter = 0
- int nl_maxit = 0
- int linear_solver = -1
- double nl_tol_abs = 1e-6
- double nl_tol_rel = 1e-6
- double lin_tol_rel = 1e-6
- double lin_tol_abs = 1e-6
- double nl_res
- double nl_relres
- double nl_res_base
- double nl_bestres
- double eps =sqrt(DBL_EPSILON)

- bool NL_Output = true
- bool L_Output = false
- bool LineSearch = false
- bool Bounce = false
- Matrix< double > F
- Matrix< double > Fv
- Matrix< double > v
- Matrix< double > x
- Matrix< double > bestx
- GMRESLP_DATA gmreslp_dat
- PCG_DATA pcg_dat
- BiCGSTAB_DATA bicgstab_dat
- CGS_DATA cgs_dat
- GMRESRP_DATA gmresrp_dat
- GCR_DATA gcr_dat
- GMRESR_DATA gmresr_dat
- BACKTRACK_DATA backtrack_dat
- const void * res_data
- const void * precon_data
- int(* funeval)(const Matrix< double > &x, Matrix< double > &F, const void *res_data)
- int(* precon)(const Matrix< double > &r, Matrix< double > &p, const void *precon_data)

6.42.1 Member Data Documentation

6.42.1.1 BACKTRACK_DATA PJFNK_DATA::backtrack_dat

6.42.1.2 Matrix<double> PJFNK_DATA::bestx

6.42.1.3 BiCGSTAB_DATA PJFNK_DATA::bicgstab_dat

6.42.1.4 bool PJFNK_DATA::Bounce = false

6.42.1.5 CGS_DATA PJFNK_DATA::cgs_dat

6.42.1.6 double PJFNK_DATA::eps =sqrt(DBL_EPSILON)

6.42.1.7 Matrix<double> PJFNK_DATA::F

6.42.1.8 int(* PJFNK_DATA::funeval)(const Matrix< double > &x, Matrix< double > &F, const void *res_data)

6.42.1.9 Matrix<double> PJFNK_DATA::Fv

6.42.1.10 GCR_DATA PJFNK_DATA::gcr_dat

6.42.1.11 GMRESLP_DATA PJFNK_DATA::gmreslp_dat

6.42.1.12 GMRESR_DATA PJFNK_DATA::gmresr_dat

6.42.1.13 GMRESRP_DATA PJFNK_DATA::gmresrp_dat

6.42.1.14 int PJFNK_DATA::l_iter = 0

6.42.1.15 bool PJFNK_DATA::L_Output = false

6.42.1.16 double PJFNK_DATA::lin_tol_abs = 1e-6

6.42.1.17 double PJFNK_DATA::lin_tol_rel = 1e-6

6.42.1.18 int PJFNK_DATA::linear_solver = -1

6.42.1.19 bool PJFNK_DATA::LineSearch = false

6.42.1.20 double PJFNK_DATA::nl_bestres

6.42.1.21 int PJFNK_DATA::nl_iter = 0

6.42.1.22 int PJFNK_DATA::nl_maxit = 0

6.42.1.23 bool PJFNK_DATA::NL_Output = true

6.42.1.24 double PJFNK_DATA::nl_relres

6.42.1.25 double PJFNK_DATA::nl_res

6.42.1.26 double PJFNK_DATA::nl_res_base

6.42.1.27 double PJFNK_DATA::nl_tol_abs = 1e-6

6.42.1.28 double PJFNK_DATA::nl_tol_rel = 1e-6

6.42.1.29 PCG_DATA PJFNK_DATA::pcg_dat

6.42.1.30 int(* PJFNK_DATA::precon)(const Matrix< double > &r, Matrix< double > &p, const void *precon_data)

6.42.1.31 const void* PJFNK_DATA::precon_data

6.42.1.32 const void* PJFNK_DATA::res_data

6.42.1.33 Matrix<double> PJFNK_DATA::v

6.42.1.34 Matrix<double> PJFNK_DATA::x

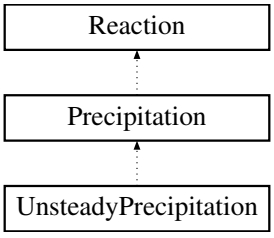
The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/lark.h

6.43 Precipitation Class Reference

`#include <shark.h>`

Inheritance diagram for Precipitation:



Additional Inherited Members

The documentation for this class was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/shark.h

6.44 PURE_GAS Struct Reference

`#include <egret.h>`

Public Attributes

- double molecular_weight
- double Sutherland_Temp
- double Sutherland_Const
- double Sutherland_Viscosity
- double specific_heat
- double molecular_diffusion
- double dynamic_viscosity
- double density
- double Schmidt

6.44.1 Member Data Documentation

6.44.1.1 double PURE_GAS::density

6.44.1.2 double PURE_GAS::dynamic_viscosity

6.44.1.3 double PURE_GAS::molecular_diffusion

6.44.1.4 double PURE_GAS::molecular_weight

6.44.1.5 double PURE_GAS::Schmidt

6.44.1.6 double PURE_GAS::specific_heat

6.44.1.7 double PURE_GAS::Sutherland_Const

6.44.1.8 double PURE_GAS::Sutherland_Temp

6.44.1.9 double PURE_GAS::Sutherland_Viscosity

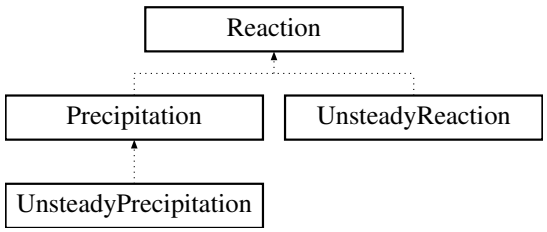
The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/egret.h

6.45 Reaction Class Reference

`#include <shark.h>`

Inheritance diagram for Reaction:



Public Member Functions

- Reaction ()
- ~Reaction ()
- void Initialize_List (MasterSpeciesList &List)
- void Display_Info ()
- void Set_Stoichiometric (int i, double v)
- void Set_Equilibrium (double v)
- void Set_Enthalpy (double H)
- void Set_Entropy (double S)
- void Set_EnthalpyANDEntropy (double H, double S)
- void Set_Energy (double G)
- void checkSpeciesEnergies ()
- void calculateEnergies ()
- void calculateEquilibrium (double T)
- bool haveEquilibrium ()
- double Get_Stoichiometric (int i)
- double Get_Equilibrium ()
- double Get_Enthalpy ()
- double Get_Entropy ()
- double Get_Energy ()
- double Eval_Residual (const Matrix< double > &x, const Matrix< double > &gama)

Protected Attributes

- MasterSpeciesList * List
- std::vector< double > Stoichiometric
- double Equilibrium
- double enthalpy
- double entropy
- double energy
- bool CanCalcHS
- bool CanCalcG
- bool HaveHS
- bool HaveG
- bool HaveEquil

6.45.1 Constructor & Destructor Documentation

6.45.1.1 Reaction::Reaction ( )

6.45.1.2 Reaction::~Reaction ( )

6.45.2 Member Function Documentation

6.45.2.1 void Reaction::calculateEnergies ( )

6.45.2.2 void Reaction::calculateEquilibrium (double *T*)

6.45.2.3 void Reaction::checkSpeciesEnergies ( )

6.45.2.4 void Reaction::Display_Info ( )

6.45.2.5 double Reaction::Eval_Residual (const Matrix< double > & *x,* const Matrix< double > & *gama*)

6.45.2.6 double Reaction::Get_Energy ( )

6.45.2.7 double Reaction::Get_Enthalpy ( )

6.45.2.8 double Reaction::Get_Entropy ( )

6.45.2.9 double Reaction::Get_Equilibrium ( )

6.45.2.10 double Reaction::Get_Stoichiometric (int *i*)

6.45.2.11 bool Reaction::haveEquilibrium ( )

6.45.2.12 void Reaction::Initialize_List (MasterSpeciesList & *List*)

6.45.2.13 void Reaction::Set_Energy (double *G*)

6.45.2.14 void Reaction::Set_Enthalpy (double *H*)

6.45.2.15 void Reaction::Set_EnthalpyANDEntropy (double *H,* double *S*)

6.45.2.16 void Reaction::Set_Entropy (double *S*)

6.45.2.17 void Reaction::Set_Equilibrium (double *v*)

6.45.2.18 void Reaction::Set_Stoichiometric (int *i,* double *v*)

6.45.3 Member Data Documentation

6.45.3.1 bool Reaction::CanCalcG [protected]

6.45.3.2 bool Reaction::CanCalcHS [protected]

6.45.3.3 double Reaction::energy [protected]

6.45.3.4 double Reaction::enthalpy [protected]

6.45.3.5 double Reaction::entropy [protected]

6.45.3.6 double Reaction::Equilibrium [protected]

6.45.3.7 bool Reaction::HaveEquil [protected]

6.45.3.8 bool Reaction::HaveG [protected]

6.45.3.9 bool Reaction::HaveHS [protected]

6.45.3.10 MasterSpeciesList* Reaction::List [protected]

6.45.3.11 std::vector<double> Reaction::Stoichiometric [protected]

The documentation for this class was generated from the following files:

- /Users/aladshaw3/projects/ecosystem/include/shark.h
- /Users/aladshaw3/projects/ecosystem/src/shark.cpp

6.46 SCOPSOWL_DATA Struct Reference

`#include <scopsowl.h>`

Public Attributes

- unsigned long int total_steps
- int coord_macro
- int coord_micro
- int level = 2
- double sim_time
- double t_old
- double t
- double t_counter = 0.0
- double t_print
- bool Print2File = true
- bool Print2Console = true
- bool SurfDiff = true
- bool Heterogeneous = true
- double gas_velocity
- double total_pressure
- double gas_temperature
- double pellet_radius
- double crystal_radius
- double char_macro
- double char_micro
- double binder_fraction
- double binder_porosity
- double binder_poresize
- double pellet_density
- bool DirichletBC = false
- bool NonLinear = true
- std::vector< double > y
- std::vector< double > tempy
- FILE * OutputFile
- double(* eval_ads)(int i, int l, const void *user_data)
- double(* eval_retard)(int i, int l, const void *user_data)
- double(* eval_diff)(int i, int l, const void *user_data)
- double(* eval_surfDiff)(int i, int l, const void *user_data)
- double(* eval_kf)(int i, const void *user_data)
- const void * user_data
- MIXED_GAS * gas_dat
- MAGPIE_DATA magpie_dat
- std::vector< FINCH_DATA > finch_dat
- std::vector< SCOPSOWL_PARAM_DATA > param_dat
- std::vector< SKUA_DATA > skua_dat

6.46.1 Member Data Documentation

6.46.1.1 double SCOPSOWL_DATA::binder_fraction

6.46.1.2 double SCOPSOWL_DATA::binder_poresize

6.46.1.3 double SCOPSOWL_DATA::binder_porosity

6.46.1.4 double SCOPSOWL_DATA::char_macro

6.46.1.5 double SCOPSOWL_DATA::char_micro

6.46.1.6 int SCOPSOWL_DATA::coord_macro

6.46.1.7 int SCOPSOWL_DATA::coord_micro

6.46.1.8 double SCOPSOWL_DATA::crystal_radius

6.46.1.9 bool SCOPSOWL_DATA::DirichletBC = false

6.46.1.10 double(* SCOPSOWL_DATA::eval_ads)(int i, int l, const void *user_data)

6.46.1.11 double(* SCOPSOWL_DATA::eval_diff)(int i, int l, const void *user_data)

6.46.1.12 double(* SCOPSOWL_DATA::eval_kf)(int i, const void *user_data)

6.46.1.13 double(* SCOPSOWL_DATA::eval_retard)(int i, int l, const void *user_data)

6.46.1.14 double(* SCOPSOWL_DATA::eval_surfDiff)(int i, int l, const void *user_data)

6.46.1.15 std::vector<FINCH_DATA> SCOPSOWL_DATA::finch_dat

6.46.1.16 MIXED_GAS* SCOPSOWL_DATA::gas_dat

6.46.1.17 double SCOPSOWL_DATA::gas_temperature

6.46.1.18 double SCOPSOWL_DATA::gas_velocity

6.46.1.19 bool SCOPSOWL_DATA::Heterogeneous = true

6.46.1.20 int SCOPSOWL_DATA::level = 2

6.46.1.21 MAGPIE_DATA SCOPSOWL_DATA::magpie_dat

6.46.1.22 bool SCOPSOWL_DATA::NonLinear = true

6.46.1.23 FILE* SCOPSOWL_DATA::OutputFile

6.46.1.24 std::vector<SCOPSOWL_PARAM_DATA> SCOPSOWL_DATA::param_dat

6.46.1.25 double SCOPSOWL_DATA::pellet_density

6.46.1.26 double SCOPSOWL_DATA::pellet_radius

6.46.1.27 bool SCOPSOWL_DATA::Print2Console = true

6.46.1.28 bool SCOPSOWL_DATA::Print2File = true

6.46.1.29 double SCOPSOWL_DATA::sim_time

6.46.1.30 std::vector<SKUA_DATA> SCOPSOWL_DATA::skua_dat

6.46.1.31 bool SCOPSOWL_DATA::SurfDiff = true

6.46.1.32 double SCOPSOWL_DATA::t

6.46.1.33 double SCOPSOWL_DATA::t_counter = 0.0

6.46.1.34 double SCOPSOWL_DATA::t_old

6.46.1.35 double SCOPSOWL_DATA::t_print

6.46.1.36 std::vector<double> SCOPSOWL_DATA::tempy

6.46.1.37 double SCOPSOWL_DATA::total_pressure

6.46.1.38 unsigned long int SCOPSOWL_DATA::total_steps

6.46.1.39 const void* SCOPSOWL_DATA::user_data

6.46.1.40 std::vector<double> SCOPSOWL_DATA::y

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/scopsowl.h

6.47 SCOPSOWL_OPT_DATA Struct Reference

`#include <scopsowl_opt.h>`

Public Attributes

- int num_curves
- int evaluation
- unsigned long int total_eval
- int current_points
- int num_params = 1
- int diffusion_type
- int adsorb_index
- int max_guess_iter = 20
- bool Optimize
- bool Rough
- double current_temp
- double current_press
- double current_equil
- double simulation_equil
- double max_bias
- double min_bias
- double e_norm
- double f_bias

- double e_norm_old
- double f_bias_old
- double param_guess
- double param_guess_old
- double rel_tol_norm = 0.01
- double abs_tol_bias = 1.0
- std::vector< double > y_base
- std::vector< double > q_data
- std::vector< double > q_sim
- std::vector< double > t
- FILE * ParamFile
- FILE * CompareFile
- SCOPSOWL_DATA owl_dat

6.47.1 Member Data Documentation

6.47.1.1 double SCOPSOWL_OPT_DATA::abs_tol_bias = 1.0

6.47.1.2 int SCOPSOWL_OPT_DATA::adsorb_index

6.47.1.3 FILE* SCOPSOWL_OPT_DATA::CompareFile

6.47.1.4 double SCOPSOWL_OPT_DATA::current_equil

6.47.1.5 int SCOPSOWL_OPT_DATA::current_points

6.47.1.6 double SCOPSOWL_OPT_DATA::current_press

6.47.1.7 double SCOPSOWL_OPT_DATA::current_temp

6.47.1.8 int SCOPSOWL_OPT_DATA::diffusion_type

6.47.1.9 double SCOPSOWL_OPT_DATA::e_norm

6.47.1.10 double SCOPSOWL_OPT_DATA::e_norm_old

6.47.1.11 int SCOPSOWL_OPT_DATA::evaluation

6.47.1.12 double SCOPSOWL_OPT_DATA::f_bias

6.47.1.13 double SCOPSOWL_OPT_DATA::f_bias_old

6.47.1.14 double SCOPSOWL_OPT_DATA::max_bias

6.47.1.15 int SCOPSOWL_OPT_DATA::max_guess_iter = 20

6.47.1.16 double SCOPSOWL_OPT_DATA::min_bias

6.47.1.17 int SCOPSOWL_OPT_DATA::num_curves

6.47.1.18 int SCOPSOWL_OPT_DATA::num_params = 1

6.47.1.19 bool SCOPSOWL_OPT_DATA::Optimize

6.47.1.20 SCOPSOWL_DATA SCOPSOWL_OPT_DATA::owl_dat

6.47.1.21 double SCOPSOWL_OPT_DATA::param_guess

6.47.1.22 double SCOPSOWL_OPT_DATA::param_guess_old

6.47.1.23 FILE* SCOPSOWL_OPT_DATA::ParamFile

6.47.1.24 std::vector<double> SCOPSOWL_OPT_DATA::q_data

6.47.1.25 std::vector<double> SCOPSOWL_OPT_DATA::q_sim

6.47.1.26 double SCOPSOWL_OPT_DATA::rel_tol_norm = 0.01

6.47.1.27 bool SCOPSOWL_OPT_DATA::Rough

6.47.1.28 double SCOPSOWL_OPT_DATA::simulation_equil

6.47.1.29 std::vector<double> SCOPSOWL_OPT_DATA::t

6.47.1.30 unsigned long int SCOPSOWL_OPT_DATA::total_eval

6.47.1.31 std::vector<double> SCOPSOWL_OPT_DATA::y_base

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/scopsowl_opt.h

6.48 SCOPSOWL_PARAM_DATA Struct Reference

`#include <scopsowl.h>`

Public Attributes

- Matrix< double > qAvg
- Matrix< double > qAvg_old
- Matrix< double > Qst
- Matrix< double > Qst_old
- Matrix< double > dq_dc
- double xIC
- double qIntegralAvg
- double qIntegralAvg_old
- double QstAvg
- double QstAvg_old
- double qo
- double Qsto
- double dq_dco
- double pore_diffusion
- double film_transfer
- double activation_energy
- double ref_diffusion
- double ref_temperature
- double affinity
- double ref_pressure
- bool Adsorbable
- std::string speciesName

6.48.1 Member Data Documentation

6.48.1.1 double SCOPSOWL_PARAM_DATA::activation_energy

6.48.1.2 bool SCOPSOWL_PARAM_DATA::Adsorbable

6.48.1.3 double SCOPSOWL_PARAM_DATA::affinity

6.48.1.4 Matrix<double> SCOPSOWL_PARAM_DATA::dq_dc

6.48.1.5 double SCOPSOWL_PARAM_DATA::dq_dco

6.48.1.6 double SCOPSOWL_PARAM_DATA::film_transfer

6.48.1.7 double SCOPSOWL_PARAM_DATA::pore_diffusion

6.48.1.8 Matrix<double> SCOPSOWL_PARAM_DATA::qAvg

6.48.1.9 Matrix<double> SCOPSOWL_PARAM_DATA::qAvg_old

6.48.1.10 double SCOPSOWL_PARAM_DATA::qIntegralAvg

6.48.1.11 double SCOPSOWL_PARAM_DATA::qIntegralAvg_old

6.48.1.12 double SCOPSOWL_PARAM_DATA::qo

6.48.1.13 Matrix<double> SCOPSOWL_PARAM_DATA::Qst

6.48.1.14 Matrix<double> SCOPSOWL_PARAM_DATA::Qst_old

6.48.1.15 double SCOPSOWL_PARAM_DATA::QstAvg

6.48.1.16 double SCOPSOWL_PARAM_DATA::QstAvg_old

6.48.1.17 double SCOPSOWL_PARAM_DATA::Qsto

6.48.1.18 double SCOPSOWL_PARAM_DATA::ref_diffusion

6.48.1.19 double SCOPSOWL_PARAM_DATA::ref_pressure

6.48.1.20 double SCOPSOWL_PARAM_DATA::ref_temperature

6.48.1.21 std::string SCOPSOWL_PARAM_DATA::speciesName

6.48.1.22 double SCOPSOWL_PARAM_DATA::xIC

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/scopsowl.h

6.49 SHARK_DATA Struct Reference

```
#include <shark.h>
```

Public Attributes

- MasterSpeciesList MasterList
- std::vector< Reaction > ReactionList
- std::vector< MassBalance > MassBalanceList
- std::vector< UnsteadyReaction > UnsteadyList
- std::vector< double(*)(const Matrix< double > &x, SHARK_DATA *shark_dat, const void *data) > OtherList
- int numvar
- int num_ssr
- int num_mbe
- int num_usr
- int num_other = 0
- int act_fun = IDEAL
- int totalsteps = 0
- int timesteps = 0
- int pH_index = -1
- int pOH_index = -1
- double simulationtime = 0.0
- double dt = 0.1
- double dt_min = sqrt(DBL_EPSILON)
- double t_out = 0.0
- double t_count = 0.0
- double time = 0.0
- double time_old = 0.0
- double pH = 7.0
- double Norm = 0.0
- double dielectric_const = 78.325
- double temperature = 298.15
- bool steadystate = true
- bool TimeAdaptivity = false
- bool const_pH = false
- bool SpeciationCurve = false
- bool Console_Output = true
- bool File_Output = false
- bool Contains_pH = false
- bool Contains_pOH = false
- bool Converged = false
- Matrix< double > X_old
- Matrix< double > X_new
- Matrix< double > Conc_old
- Matrix< double > Conc_new
- Matrix< double > activity_new
- Matrix< double > activity_old
- int(* EvalActivity)(const Matrix< double > &x, Matrix< double > &F, const void *data)
- int(* Residual)(const Matrix< double > &x, Matrix< double > &F, const void *data)
- int(* lin_precon)(const Matrix< double > &r, Matrix< double > &p, const void *data)
- PJFNK_DATA Newton_data
- const void * activity_data
- const void * residual_data
- const void * precon_data
- const void * other_data
- FILE * OutputFile
- yaml_cpp_class yaml_object

6.49.1 Member Data Documentation

6.49.1.1 int SHARK_DATA::act_fun = IDEAL

6.49.1.2 const void* SHARK_DATA::activity_data

6.49.1.3 Matrix<double> SHARK_DATA::activity_new

6.49.1.4 Matrix<double> SHARK_DATA::activity_old

6.49.1.5 Matrix<double> SHARK_DATA::Conc_new

6.49.1.6 Matrix<double> SHARK_DATA::Conc_old

6.49.1.7 bool SHARK_DATA::Console_Output = true

6.49.1.8 bool SHARK_DATA::const_pH = false

6.49.1.9 bool SHARK_DATA::Contains_pH = false

6.49.1.10 bool SHARK_DATA::Contains_pOH = false

6.49.1.11 bool SHARK_DATA::Converged = false

6.49.1.12 double SHARK_DATA::dielectric_const = 78.325

6.49.1.13 double SHARK_DATA::dt = 0.1

6.49.1.14 double SHARK_DATA::dt_min = sqrt(DBL_EPSILON)

6.49.1.15 int(* SHARK_DATA::EvalActivity)(const Matrix< double > &x, Matrix< double > &F, const void *data)

6.49.1.16 bool SHARK_DATA::File_Output = false

6.49.1.17 int(* SHARK_DATA::lin_precon)(const Matrix< double > &r, Matrix< double > &p, const void *data)

6.49.1.18 std::vector<MassBalance> SHARK_DATA::MassBalanceList

6.49.1.19 MasterSpeciesList SHARK_DATA::MasterList

6.49.1.20 PJFNK_DATA SHARK_DATA::Newton_data

6.49.1.21 double SHARK_DATA::Norm = 0.0

6.49.1.22 int SHARK_DATA::num_mbe

6.49.1.23 int SHARK_DATA::num_other = 0

6.49.1.24 int SHARK_DATA::num_ssr

6.49.1.25 int SHARK_DATA::num_usr

6.49.1.26 int SHARK_DATA::numvar

6.49.1.27 const void* SHARK_DATA::other_data

6.49.1.28 std::vector< double (*) (const Matrix<double> &x, SHARK_DATA *shark_dat, const void *data) > SHARK_DATA::OtherList

6.49.1.29 FILE* SHARK_DATA::OutputFile

6.49.1.30 double SHARK_DATA::pH = 7.0

6.49.1.31 int SHARK_DATA::pH_index = -1

6.49.1.32 int SHARK_DATA::pOH_index = -1

6.49.1.33 const void* SHARK_DATA::precon_data

6.49.1.34 std::vector<Reaction> SHARK_DATA::ReactionList

6.49.1.35 int(* SHARK_DATA::Residual)(const Matrix< double > &x, Matrix< double > &F, const void *data)

6.49.1.36 const void* SHARK_DATA::residual_data

6.49.1.37 double SHARK_DATA::simulationtime = 0.0

6.49.1.38 bool SHARK_DATA::SpeciationCurve = false

6.49.1.39 bool SHARK_DATA::steadystate = true

6.49.1.40 double SHARK_DATA::t_count = 0.0

6.49.1.41 double SHARK_DATA::t_out = 0.0

6.49.1.42 double SHARK_DATA::temperature = 298.15

6.49.1.43 double SHARK_DATA::time = 0.0

6.49.1.44 double SHARK_DATA::time_old = 0.0

6.49.1.45 bool SHARK_DATA::TimeAdaptivity = false

6.49.1.46 int SHARK_DATA::timesteps = 0

6.49.1.47 int SHARK_DATA::totalsteps = 0

6.49.1.48 std::vector<UnsteadyReaction> SHARK_DATA::UnsteadyList

6.49.1.49 Matrix<double> SHARK_DATA::X_new

6.49.1.50 Matrix<double> SHARK_DATA::X_old

6.49.1.51 yaml_cpp_class SHARK_DATA::yaml_object

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/shark.h

6.50 SKUA_DATA Struct Reference

`#include <skua.h>`

Public Attributes

- unsigned long int total_steps
- int coord
- double sim_time
- double t_old
- double t
- double t_counter = 0.0
- double t_print
- double qTn
- double qTnp1
- bool Print2File = true
- bool Print2Console = true
- double gas_velocity
- double pellet_radius
- double char_measure
- bool DirichletBC = true
- bool NonLinear = true
- std::vector< double > y
- FILE * OutputFile
- double(* eval_diff)(int i, int l, const void *user_data)
- double(* eval_kf)(int i, const void *user_data)
- const void * user_data
- MAGPIE_DATA magpie_dat
- MIXED_GAS * gas_dat
- std::vector< FINCH_DATA > finch_dat
- std::vector< SKUA_PARAM > param_dat

6.50.1 Member Data Documentation

6.50.1.1 double SKUA_DATA::char_measure

6.50.1.2 int SKUA_DATA::coord

6.50.1.3 bool SKUA_DATA::DirichletBC = true

6.50.1.4 double(* SKUA_DATA::eval_diff)(int i, int l, const void *user_data)

6.50.1.5 double(* SKUA_DATA::eval_kf)(int i, const void *user_data)

6.50.1.6 std::vector<FINCH_DATA> SKUA_DATA::finch_dat

6.50.1.7 MIXED_GAS* SKUA_DATA::gas_dat

6.50.1.8 double SKUA_DATA::gas_velocity

6.50.1.9 MAGPIE_DATA SKUA_DATA::magpie_dat

6.50.1.10 bool SKUA_DATA::NonLinear = true

6.50.1.11 FILE* SKUA_DATA::OutputFile

6.50.1.12 std::vector<SKUA_PARAM> SKUA_DATA::param_dat

6.50.1.13 double SKUA_DATA::pellet_radius

6.50.1.14 bool SKUA_DATA::Print2Console = true

6.50.1.15 bool SKUA_DATA::Print2File = true

6.50.1.16 double SKUA_DATA::qTn

6.50.1.17 double SKUA_DATA::qTnp1

6.50.1.18 double SKUA_DATA::sim_time

6.50.1.19 double SKUA_DATA::t

6.50.1.20 double SKUA_DATA::t_counter = 0.0

6.50.1.21 double SKUA_DATA::t_old

6.50.1.22 double SKUA_DATA::t_print

6.50.1.23 unsigned long int SKUA_DATA::total_steps

6.50.1.24 const void* SKUA_DATA::user_data

6.50.1.25 std::vector<double> SKUA_DATA::y

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/skua.h

6.51 SKUA_OPT_DATA Struct Reference

`#include <skua_opt.h>`

Public Attributes

- int num_curves
- int evaluation
- unsigned long int total_eval
- int current_points
- int num_params = 1
- int diffusion_type
- int adsorb_index
- int max_guess_iter = 20
- bool Optimize
- bool Rough
- double current_temp
- double current_press
- double current_equil
- double simulation_equil

- double max_bias
- double min_bias
- double e_norm
- double f_bias
- double e_norm_old
- double f_bias_old
- double param_guess
- double param_guess_old
- double rel_tol_norm = 0.1
- double abs_tol_bias = 0.1
- std::vector< double > y_base
- std::vector< double > q_data
- std::vector< double > q_sim
- std::vector< double > t
- FILE * ParamFile
- FILE * CompareFile
- SKUA_DATA skua_dat

6.51.1 Member Data Documentation

6.51.1.1 double SKUA_OPT_DATA::abs_tol_bias = 0.1

6.51.1.2 int SKUA_OPT_DATA::adsorb_index

6.51.1.3 FILE* SKUA_OPT_DATA::CompareFile

6.51.1.4 double SKUA_OPT_DATA::current_equil

6.51.1.5 int SKUA_OPT_DATA::current_points

6.51.1.6 double SKUA_OPT_DATA::current_press

6.51.1.7 double SKUA_OPT_DATA::current_temp

6.51.1.8 int SKUA_OPT_DATA::diffusion_type

6.51.1.9 double SKUA_OPT_DATA::e_norm

6.51.1.10 double SKUA_OPT_DATA::e_norm_old

6.51.1.11 int SKUA_OPT_DATA::evaluation

6.51.1.12 double SKUA_OPT_DATA::f_bias

6.51.1.13 double SKUA_OPT_DATA::f_bias_old

6.51.1.14 double SKUA_OPT_DATA::max_bias

6.51.1.15 int SKUA_OPT_DATA::max_guess_iter = 20

6.51.1.16 double SKUA_OPT_DATA::min_bias

6.51.1.17 int SKUA_OPT_DATA::num_curves

6.51.1.18 int SKUA_OPT_DATA::num_params = 1

6.51.1.19 bool SKUA_OPT_DATA::Optimize

6.51.1.20 double SKUA_OPT_DATA::param_guess

6.51.1.21 double SKUA_OPT_DATA::param_guess_old

6.51.1.22 FILE* SKUA_OPT_DATA::ParamFile

6.51.1.23 std::vector<double> SKUA_OPT_DATA::q_data

6.51.1.24 std::vector<double> SKUA_OPT_DATA::q_sim

6.51.1.25 double SKUA_OPT_DATA::rel_tol_norm = 0.1

6.51.1.26 bool SKUA_OPT_DATA::Rough

6.51.1.27 double SKUA_OPT_DATA::simulation_equil

6.51.1.28 SKUA_DATA SKUA_OPT_DATA::skua_dat

6.51.1.29 std::vector<double> SKUA_OPT_DATA::t

6.51.1.30 unsigned long int SKUA_OPT_DATA::total_eval

6.51.1.31 std::vector<double> SKUA_OPT_DATA::y_base

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/skua_opt.h

6.52 SKUA_PARAM Struct Reference

`#include <skua.h>`

Public Attributes

- double activation_energy
- double ref_diffusion
- double ref_temperature
- double affinity
- double ref_pressure
- double film_transfer
- double xIC
- double y_eff
- double Qstn
- double Qstnp1
- double xn
- double xnp1
- bool Adsorbable
- std::string speciesName

6.52.1 Member Data Documentation

6.52.1.1 double SKUA_PARAM::activation_energy

6.52.1.2 bool SKUA_PARAM::Adsorbable

6.52.1.3 double SKUA_PARAM::affinity

6.52.1.4 double SKUA_PARAM::film_transfer

6.52.1.5 double SKUA_PARAM::Qstn

6.52.1.6 double SKUA_PARAM::Qstnp1

6.52.1.7 double SKUA_PARAM::ref_diffusion

6.52.1.8 double SKUA_PARAM::ref_pressure

6.52.1.9 double SKUA_PARAM::ref_temperature

6.52.1.10 std::string SKUA_PARAM::speciesName

6.52.1.11 double SKUA_PARAM::xIC

6.52.1.12 double SKUA_PARAM::xn

6.52.1.13 double SKUA_PARAM::xnp1

6.52.1.14 double SKUA_PARAM::y_eff

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/skua.h

6.53 Speciation_Test01_Data Struct Reference

`#include <sandbox.h>`

Public Attributes

- int N = 4
- const double logKw = -14.0
- const double logKa1 = -6.35
- const double logKa2 = -10.33
- double CT = 0.1786
- double NaT = 0.1786
- std::vector< Molecule > x
- Matrix< double > Jacobian
- Matrix< double > NumJac
- Matrix< double > logC
- Matrix< double > C

6.53.1 Member Data Documentation

6.53.1.1 Matrix<double> Speciation_Test01_Data::C

6.53.1.2 double Speciation_Test01_Data::CT = 0.1786

6.53.1.3 Matrix<double> Speciation_Test01_Data::Jacobian

6.53.1.4 Matrix<double> Speciation_Test01_Data::logC

6.53.1.5 const double Speciation_Test01_Data::logKa1 = -6.35

6.53.1.6 const double Speciation_Test01_Data::logKa2 = -10.33

6.53.1.7 const double Speciation_Test01_Data::logKw = -14.0

6.53.1.8 int Speciation_Test01_Data::N = 4

6.53.1.9 double Speciation_Test01_Data::NaT = 0.1786

6.53.1.10 Matrix<double> Speciation_Test01_Data::NumJac

6.53.1.11 std::vector<Molecule> Speciation_Test01_Data::x

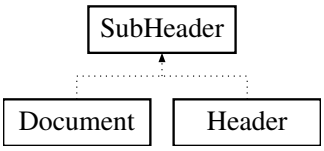
The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/sandbox.h

6.54 SubHeader Class Reference

`#include <yaml_wrapper.h>`

Inheritance diagram for SubHeader:



Public Member Functions

- SubHeader ()
- ~SubHeader ()
- SubHeader (const SubHeader &subheader)
- SubHeader (const KeyValueMap &map)
- SubHeader (std::string name)
- SubHeader (std::string name, const KeyValueMap &map)
- SubHeader & operator= (const SubHeader &sub)
- ValueTypePair & operator[] (const std::string key)
- ValueTypePair operator[] (const std::string key) const
- KeyValueMap & getMap ()
- void clear ()
- void addPair (std::string key, std::string val)

- void addPair (std::string key, std::string val, int type)
- void setName (std::string name)
- void setAlias (std::string alias)
- void setAlias (std::string alias, int state)
- void setNameAliasPair (std::string name, std::string alias, int state)
- void setState (int state)
- void DisplayContents ()
- std::string getName ()
- std::string getAlias ()
- bool isAlias ()
- bool isAnchor ()
- int getState ()

Protected Attributes

- KeyValueMap Data_Map
- std::string name
- std::string alias
- int state

6.54.1 Constructor & Destructor Documentation

6.54.1.1 SubHeader::SubHeader ( )

6.54.1.2 SubHeader::~SubHeader ( )

6.54.1.3 SubHeader::SubHeader (const SubHeader & *subheader*)

6.54.1.4 SubHeader::SubHeader (const KeyValueMap & *map*)

6.54.1.5 SubHeader::SubHeader (std::string *name*)

6.54.1.6 SubHeader::SubHeader (std::string *name,* const KeyValueMap & *map*)

6.54.2 Member Function Documentation

6.54.2.1 void SubHeader::addPair (std::string *key,* std::string *val*)

6.54.2.2 void SubHeader::addPair (std::string *key,* std::string *val,* int *type*)

6.54.2.3 void SubHeader::clear ( )

6.54.2.4 void SubHeader::DisplayContents ( )

6.54.2.5 std::string SubHeader::getAlias ( )

6.54.2.6 KeyValueMap & SubHeader::getMap ( )

6.54.2.7 std::string SubHeader::getName ( )

6.54.2.8 int SubHeader::getState ( )

6.54.2.9 bool SubHeader::isAlias ( )

6.54.2.10 bool SubHeader::isAnchor ( )

6.54.2.11 SubHeader & SubHeader::operator= (const SubHeader & *sub*)

6.54.2.12 ValueTypePair & SubHeader::operator[] (const std::string *key*)

6.54.2.13 ValueTypePair SubHeader::operator[] (const std::string *key*) const

6.54.2.14 void SubHeader::setAlias (std::string *alias*)

6.54.2.15 void SubHeader::setAlias (std::string *alias,* int *state*)

6.54.2.16 void SubHeader::setName (std::string *name*)

6.54.2.17 void SubHeader::setNameAliasPair (std::string *name,* std::string *alias,* int *state*)

6.54.2.18 void SubHeader::setState (int *state*)

6.54.3 Member Data Documentation

6.54.3.1 std::string SubHeader::alias [protected]

6.54.3.2 KeyValueMap SubHeader::Data_Map [protected]

6.54.3.3 std::string SubHeader::name [protected]

6.54.3.4 int SubHeader::state [protected]

The documentation for this class was generated from the following files:

- /Users/aladshaw3/projects/ecosystem/include/yaml_wrapper.h
- /Users/aladshaw3/projects/ecosystem/src/yaml_wrapper.cpp

6.55 SYSTEM_DATA Struct Reference

`#include <magpie.h>`

Public Attributes

- double T
- double PT
- double qT
- double PI
- double pi
- double As
- int N
- int I
- int J
- int K
- unsigned long int total_eval
- double avg_norm
- double max_norm
- int Sys
- int Par

- bool Recover
- bool Carrier
- bool Ideal
- bool Output

6.55.1 Member Data Documentation

6.55.1.1 double SYSTEM_DATA::As

6.55.1.2 double SYSTEM_DATA::avg_norm

6.55.1.3 bool SYSTEM_DATA::Carrier

6.55.1.4 int SYSTEM_DATA::I

6.55.1.5 bool SYSTEM_DATA::Ideal

6.55.1.6 int SYSTEM_DATA::J

6.55.1.7 int SYSTEM_DATA::K

6.55.1.8 double SYSTEM_DATA::max_norm

6.55.1.9 int SYSTEM_DATA::N

6.55.1.10 bool SYSTEM_DATA::Output

6.55.1.11 int SYSTEM_DATA::Par

6.55.1.12 double SYSTEM_DATA::PI

6.55.1.13 double SYSTEM_DATA::pi

6.55.1.14 double SYSTEM_DATA::PT

6.55.1.15 double SYSTEM_DATA::qT

6.55.1.16 bool SYSTEM_DATA::Recover

6.55.1.17 int SYSTEM_DATA::Sys

6.55.1.18 double SYSTEM_DATA::T

6.55.1.19 unsigned long int SYSTEM_DATA::total_eval

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/magpie.h

6.56 TRAJECTORY_DATA Struct Reference

```
#include <Trajectory.h>
```

Public Attributes

- double mu_0 = 12.57e-7
- double rho_f = 1000.0
- double eta = 0.001
- double Hamaker = 1.3e-21
- double Temp = 298
- double k = 1.38e-23
- double Rs = 0.0026925
- double L = 0.0611
- double porosity = 0.8979
- double V_separator
- double a = 33.0e-6
- double V_wire
- double L_wire
- double A_separator
- double A_wire
- double B0 = 1.0
- double H0
- double Ms = 0.6
- double b = 0.25e-6
- double chi_p = 3.87e-6
- double rho_p = 8700.0
- double Q_in
- double V0
- double Y_initial = 20.0
- double dt
- double M
- double mp
- double beta
- double q_bar
- double sigma_v
- double sigma_vz
- double sigma_z
- double sigma_n
- double sigma_m
- double n_rand
- double m_rand
- double s_rand
- double t_rand
- Matrix< double > POL
- Matrix< double > H
- Matrix< double > dX
- Matrix< double > dY
- Matrix< double > X
- Matrix< double > Y
- Matrix< int > Cap

6.56.1 Member Data Documentation

6.56.1.1 double TRAJECTORY_DATA::a = 33.0e-6

6.56.1.2 double TRAJECTORY_DATA::A_separator

6.56.1.3 double TRAJECTORY_DATA::A_wire

6.56.1.4 double TRAJECTORY_DATA::b = 0.25e-6

6.56.1.5 double TRAJECTORY_DATA::B0 = 1.0

6.56.1.6 double TRAJECTORY_DATA::beta

6.56.1.7 Matrix<int> TRAJECTORY_DATA::Cap

6.56.1.8 double TRAJECTORY_DATA::chi_p = 3.87e-6

6.56.1.9 double TRAJECTORY_DATA::dt

6.56.1.10 Matrix<double> TRAJECTORY_DATA::dX

6.56.1.11 Matrix<double> TRAJECTORY_DATA::dY

6.56.1.12 double TRAJECTORY_DATA::eta = 0.001

6.56.1.13 Matrix<double> TRAJECTORY_DATA::H

6.56.1.14 double TRAJECTORY_DATA::H0

6.56.1.15 double TRAJECTORY_DATA::Hamaker = 1.3e-21

6.56.1.16 double TRAJECTORY_DATA::k = 1.38e-23

6.56.1.17 double TRAJECTORY_DATA::L = 0.0611

6.56.1.18 double TRAJECTORY_DATA::L_wire

6.56.1.19 double TRAJECTORY_DATA::M

6.56.1.20 double TRAJECTORY_DATA::m_rand

6.56.1.21 double TRAJECTORY_DATA::mp

6.56.1.22 double TRAJECTORY_DATA::Ms = 0.6

6.56.1.23 double TRAJECTORY_DATA::mu_0 = 12.57e-7

6.56.1.24 double TRAJECTORY_DATA::n_rand

6.56.1.25 Matrix<double> TRAJECTORY_DATA::POL

6.56.1.26 double TRAJECTORY_DATA::porosity = 0.8979

6.56.1.27 double TRAJECTORY_DATA::q_bar

6.56.1.28 double TRAJECTORY_DATA::Q_in

6.56.1.29 double TRAJECTORY_DATA::rho_f = 1000.0

6.56.1.30 double TRAJECTORY_DATA::rho_p = 8700.0

6.56.1.31 double TRAJECTORY_DATA::Rs = 0.0026925

6.56.1.32 double TRAJECTORY_DATA::s_rand

6.56.1.33 double TRAJECTORY_DATA::sigma_m

6.56.1.34 double TRAJECTORY_DATA::sigma_n

6.56.1.35 double TRAJECTORY_DATA::sigma_v

6.56.1.36 double TRAJECTORY_DATA::sigma_vz

6.56.1.37 double TRAJECTORY_DATA::sigma_z

6.56.1.38 double TRAJECTORY_DATA::t_rand

6.56.1.39 double TRAJECTORY_DATA::Temp = 298

6.56.1.40 double TRAJECTORY_DATA::V0

6.56.1.41 double TRAJECTORY_DATA::V_separator

6.56.1.42 double TRAJECTORY_DATA::V_wire

6.56.1.43 Matrix<double> TRAJECTORY_DATA::X

6.56.1.44 Matrix<double> TRAJECTORY_DATA::Y

6.56.1.45 double TRAJECTORY_DATA::Y_initial = 20.0

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/Trajectory.h

6.57 UI_DATA Struct Reference

`#include <ui.h>`

Public Attributes

- ValueTypePair value_type
- std::vector< std::string > user_input
- std::vector< std::string > input_files
- std::string path
- int count = 0
- int max = 3
- int option
- bool Path = false

- bool Files = false
- bool MissingArg = true
- bool BasicUI = true
- int argc
- const char * argv []

6.57.1 Member Data Documentation

6.57.1.1 int UI_DATA::argc

6.57.1.2 const char* UI_DATA::argv[]

6.57.1.3 bool UI_DATA::BasicUI = true

6.57.1.4 int UI_DATA::count = 0

6.57.1.5 bool UI_DATA::Files = false

6.57.1.6 std::vector<std::string> UI_DATA::input_files

6.57.1.7 int UI_DATA::max = 3

6.57.1.8 bool UI_DATA::MissingArg = true

6.57.1.9 int UI_DATA::option

6.57.1.10 std::string UI_DATA::path

6.57.1.11 bool UI_DATA::Path = false

6.57.1.12 std::vector<std::string> UI_DATA::user_input

6.57.1.13 ValueTypePair UI_DATA::value_type

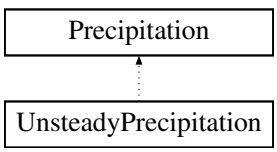
The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/ui.h

6.58 UnsteadyPrecipitation Class Reference

`#include <shark.h>`

Inheritance diagram for UnsteadyPrecipitation:



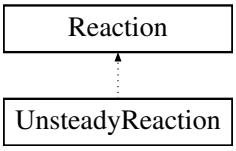
The documentation for this class was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/shark.h

6.59 UnsteadyReaction Class Reference

`#include <shark.h>`

Inheritance diagram for UnsteadyReaction:



Public Member Functions

- UnsteadyReaction ()
- ~UnsteadyReaction ()
- void Initialize_List (MasterSpeciesList &List)
- void Display_Info ()
- void Set_Species_Index (int i)
- void Set_Species_Index (std::string formula)
- void Set_Stoichiometric (int i, double v)
- void Set_Equilibrium (double v)
- void Set_Enthalpy (double H)
- void Set_Entropy (double S)
- void Set_EnthalpyANDEntropy (double H, double S)
- void Set_Energy (double G)
- void Set_InitialValue (double ic)
- void Set_MaximumValue (double max)
- void Set_Forward (double forward)
- void Set_Reverse (double reverse)
- void Set_ForwardRef (double Fref)
- void Set_ReverseRef (double Rref)
- void Set_ActivationEnergy (double E)
- void Set_Affinity (double b)
- void Set_TimeStep (double dt)
- void checkSpeciesEnergies ()
- void calculateEnergies ()
- void calculateEquilibrium (double T)
- void calculateRate (double T)
- bool haveEquilibrium ()
- bool haveRate ()
- int Get_Species_Index ()
- double Get_Stoichiometric (int i)
- double Get_Equilibrium ()
- double Get_Enthalpy ()
- double Get_Entropy ()
- double Get_Energy ()
- double Get_InitialValue ()
- double Get_MaximumValue ()
- double Get_Forward ()
- double Get_Reverse ()
- double Get_ForwardRef ()
- double Get_ReverseRef ()
- double Get_ActivationEnergy ()

- double Get_Affinity ()
- double Get_TimeStep ()
- double Eval_ReactionRate (const Matrix< double > &x, const Matrix< double > &gama)
- double Eval_Residual (const Matrix< double > &x_new, const Matrix< double > &x_old, const Matrix< double > &gama_new, const Matrix< double > &gama_old)
- double Eval_Residual (const Matrix< double > &x, const Matrix< double > &gama)
- double Eval_IC_Residual (const Matrix< double > &x)
- double Explicit_Eval (const Matrix< double > &x, const Matrix< double > &gama)

Protected Attributes

- double initial_value
- double max_value
- double forward_rate
- double reverse_rate
- double forward_ref_rate
- double reverse_ref_rate
- double activation_energy
- double temperature_affinity
- double time_step
- bool HaveForward
- bool HaveReverse
- bool HaveForRef
- bool HaveRevRef
- int species_index

Additional Inherited Members

6.59.1 Constructor & Destructor Documentation

6.59.1.1 UnsteadyReaction::UnsteadyReaction ( )

6.59.1.2 UnsteadyReaction::~UnsteadyReaction ( )

6.59.2 Member Function Documentation

6.59.2.1 void UnsteadyReaction::calculateEnergies ( )

6.59.2.2 void UnsteadyReaction::calculateEquilibrium (double *T*)

6.59.2.3 void UnsteadyReaction::calculateRate (double *T*)

6.59.2.4 void UnsteadyReaction::checkSpeciesEnergies ( )

6.59.2.5 void UnsteadyReaction::Display_Info ( )

6.59.2.6 double UnsteadyReaction::Eval_IC_Residual (const Matrix< double > & *x*)

6.59.2.7 double UnsteadyReaction::Eval_ReactionRate (const Matrix< double > & *x*, const Matrix< double > & *gama*)

6.59.2.8 double UnsteadyReaction::Eval_Residual (const Matrix< double > & *x_new*, const Matrix< double > & *x_old*, const Matrix< double > & *gama_new*, const Matrix< double > & *gama_old*)

6.59.2.9 double UnsteadyReaction::Eval_Residual (const Matrix< double > & *x*, const Matrix< double > & *gama*)

6.59.2.10 double UnsteadyReaction::Explicit_Eval (const Matrix< double > & *x,* const Matrix< double > & *gama*)

6.59.2.11 double UnsteadyReaction::Get_ActivationEnergy ( )

6.59.2.12 double UnsteadyReaction::Get_Affinity ( )

6.59.2.13 double UnsteadyReaction::Get_Energy ( )

6.59.2.14 double UnsteadyReaction::Get_Enthalpy ( )

6.59.2.15 double UnsteadyReaction::Get_Entropy ( )

6.59.2.16 double UnsteadyReaction::Get_Equilibrium ( )

6.59.2.17 double UnsteadyReaction::Get_Forward ( )

6.59.2.18 double UnsteadyReaction::Get_ForwardRef ( )

6.59.2.19 double UnsteadyReaction::Get_InitialValue ( )

6.59.2.20 double UnsteadyReaction::Get_MaximumValue ( )

6.59.2.21 double UnsteadyReaction::Get_Reverse ( )

6.59.2.22 double UnsteadyReaction::Get_ReverseRef ( )

6.59.2.23 int UnsteadyReaction::Get_Species_Index ( )

6.59.2.24 double UnsteadyReaction::Get_Stoichiometric (int *i*)

6.59.2.25 double UnsteadyReaction::Get_TimeStep ( )

6.59.2.26 bool UnsteadyReaction::haveEquilibrium ( )

6.59.2.27 bool UnsteadyReaction::haveRate ( )

6.59.2.28 void UnsteadyReaction::Initialize_List (MasterSpeciesList & *List*)

6.59.2.29 void UnsteadyReaction::Set_ActivationEnergy (double *E*)

6.59.2.30 void UnsteadyReaction::Set_Affinity (double *b*)

6.59.2.31 void UnsteadyReaction::Set_Energy (double *G*)

6.59.2.32 void UnsteadyReaction::Set_Enthalpy (double *H*)

6.59.2.33 void UnsteadyReaction::Set_EnthalpyANDEntropy (double *H,* double *S*)

6.59.2.34 void UnsteadyReaction::Set_Entropy (double *S*)

6.59.2.35 void UnsteadyReaction::Set_Equilibrium (double *v*)

6.59.2.36 void UnsteadyReaction::Set_Forward (double *forward*)

6.59.2.37 void UnsteadyReaction::Set_ForwardRef (double *Fref*)

6.59.2.38 void UnsteadyReaction::Set_InitialValue (double *ic*)

6.59.2.39 void UnsteadyReaction::Set_MaximumValue (double *max*)

6.59.2.40 void UnsteadyReaction::Set_Reverse (double *reverse*)

6.59.2.41 void UnsteadyReaction::Set_ReverseRef (double *Rref*)

6.59.2.42 void UnsteadyReaction::Set_Species_Index (int *i*)

6.59.2.43 void UnsteadyReaction::Set_Species_Index (std::string *formula*)

6.59.2.44 void UnsteadyReaction::Set_Stoichiometric (int *i,* double *v*)

6.59.2.45 void UnsteadyReaction::Set_TimeStep (double *dt*)

6.59.3 Member Data Documentation

6.59.3.1 double UnsteadyReaction::activation_energy [protected]

6.59.3.2 double UnsteadyReaction::forward_rate [protected]

6.59.3.3 double UnsteadyReaction::forward_ref_rate [protected]

6.59.3.4 bool UnsteadyReaction::HaveForRef [protected]

6.59.3.5 bool UnsteadyReaction::HaveForward [protected]

6.59.3.6 bool UnsteadyReaction::HaveReverse [protected]

6.59.3.7 bool UnsteadyReaction::HaveRevRef [protected]

6.59.3.8 double UnsteadyReaction::initial_value [protected]

6.59.3.9 double UnsteadyReaction::max_value [protected]

6.59.3.10 double UnsteadyReaction::reverse_rate [protected]

6.59.3.11 double UnsteadyReaction::reverse_ref_rate [protected]

6.59.3.12 int UnsteadyReaction::species_index [protected]

6.59.3.13 double UnsteadyReaction::temperature_affinity [protected]

6.59.3.14 double UnsteadyReaction::time_step [protected]

The documentation for this class was generated from the following files:

- /Users/aladshaw3/projects/ecosystem/include/shark.h
- /Users/aladshaw3/projects/ecosystem/src/shark.cpp

6.60 ValueTypePair Class Reference

```
#include <yaml_wrapper.h>
```

Public Member Functions

- ValueTypePair ()
- ~ValueTypePair ()
- ValueTypePair (const std::pair< std::string, int > &vt)
- ValueTypePair (std::string value, int type)
- ValueTypePair (const ValueTypePair &vt)
- ValueTypePair & operator= (const ValueTypePair &vt)
- void editValue (std::string value)
- void editPair (std::string value, int type)
- void findType ()
- void assertType (int type)
- void DisplayPair ()
- std::string getString ()
- bool getBool ()
- double getDouble ()
- int getInt ()
- std::string getValue ()
- int getType ()
- std::pair< std::string, int > & getPair ()

Private Attributes

- std::pair< std::string, int > Value_Type
- int type

6.60.1 Constructor & Destructor Documentation

6.60.1.1 ValueTypePair::ValueTypePair ( )

6.60.1.2 ValueTypePair::~ValueTypePair ( )

6.60.1.3 ValueTypePair::ValueTypePair (const std::pair< std::string, int > & *vt*)

6.60.1.4 ValueTypePair::ValueTypePair (std::string *value,* int *type*)

6.60.1.5 ValueTypePair::ValueTypePair (const ValueTypePair & *vt*)

6.60.2 Member Function Documentation

6.60.2.1 void ValueTypePair::assertType (int *type*)

6.60.2.2 void ValueTypePair::DisplayPair ( )

6.60.2.3 void ValueTypePair::editPair (std::string *value,* int *type*)

6.60.2.4 void ValueTypePair::editValue (std::string *value*)

6.60.2.5 void ValueTypePair::findType ( )

6.60.2.6 bool ValueTypePair::getBool ( )

6.60.2.7 double ValueTypePair::getDouble ( )

6.60.2.8 int ValueTypePair::getInt ( )

6.60.2.9 std::pair< std::string, int > & ValueTypePair::getPair ( )

6.60.2.10 std::string ValueTypePair::getString ( )

6.60.2.11 int ValueTypePair::getType ( )

6.60.2.12 std::string ValueTypePair::getValue ( )

6.60.2.13 ValueTypePair & ValueTypePair::operator= (const ValueTypePair & *vt*)

6.60.3 Member Data Documentation

6.60.3.1 int ValueTypePair::type [private]

6.60.3.2 std::pair<std::string,int> ValueTypePair::Value_Type [private]

The documentation for this class was generated from the following files:

- /Users/aladshaw3/projects/ecosystem/include/yaml_wrapper.h
- /Users/aladshaw3/projects/ecosystem/src/yaml_wrapper.cpp

6.61 yaml_alias_data_s Struct Reference

`#include <yaml.h>`

Public Attributes

- yaml_char_t * anchor
- int index
- yaml_mark_t mark

6.61.1 Detailed Description

This structure holds aliases data.

6.61.2 Member Data Documentation

6.61.2.1 yaml_char_t* yaml_alias_data_s::anchor

The anchor.

6.61.2.2 int yaml_alias_data_s::index

The node id.

6.61.2.3 yaml_mark_t yaml_alias_data_s::mark

The anchor mark.

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/yaml.h

6.62 yaml_cpp_class Class Reference

`#include <yaml_wrapper.h>`

Public Member Functions

- yaml_cpp_class ()
- ~yaml_cpp_class ()
- int setInputFile (const char *file)
- int readInputFile ()
- int cleanup ()
- int executeYamlRead (const char *file)
- YamlWrapper & getYamlWrapper ()
- void DisplayContents ()

Private Attributes

- YamlWrapper yaml_wrapper
- FILE * input_file
- const char * file_name
- yaml_parser_t token_parser
- yaml_token_t current_token
- yaml_token_t previous_token

6.62.1 Constructor & Destructor Documentation

6.62.1.1 yaml_cpp_class::yaml_cpp_class ( )

6.62.1.2 yaml_cpp_class::~yaml_cpp_class ( )

6.62.2 Member Function Documentation

6.62.2.1 int yaml_cpp_class::cleanup ( )

6.62.2.2 void yaml_cpp_class::DisplayContents ( )

6.62.2.3 int yaml_cpp_class::executeYamlRead (const char * *file*)

6.62.2.4 YamlWrapper & yaml_cpp_class::getYamlWrapper ( )

6.62.2.5 int yaml_cpp_class::readInputFile ( )

6.62.2.6 int yaml_cpp_class::setInputFile (const char * *file*)

6.62.3 Member Data Documentation

6.62.3.1 yaml_token_t yaml_cpp_class::current_token [private]

6.62.3.2 const char* yaml_cpp_class::file_name [private]

6.62.3.3 FILE* yaml_cpp_class::input_file [private]

6.62.3.4 yaml_token_t yaml_cpp_class::previous_token [private]

6.62.3.5 yaml_parser_t yaml_cpp_class::token_parser [private]

6.62.3.6 YamlWrapper yaml_cpp_class::yaml_wrapper [private]

The documentation for this class was generated from the following files:

- /Users/aladshaw3/projects/ecosystem/include/yaml_wrapper.h
- /Users/aladshaw3/projects/ecosystem/src/yaml_wrapper.cpp

6.63 yaml_document_s Struct Reference

`#include <yaml.h>`

Public Attributes

- struct {
  yaml_node_t * start
  yaml_node_t * end
  yaml_node_t * top
  } nodes

- yaml_version_directive_t * version_directive
- struct {
  yaml_tag_directive_t * start
  yaml_tag_directive_t * end
  } tag_directives

- int start_implicit
- int end_implicit
- yaml_mark_t start_mark
- yaml_mark_t end_mark

6.63.1 Detailed Description

The document structure.

6.63.2 Member Data Documentation

6.63.2.1 yaml_node_t* yaml_document_s::end

The end of the stack.

6.63.2.2 yaml_tag_directive_t* yaml_document_s::end

The end of the tag directives list.

6.63.2.3 int yaml_document_s::end_implicit

Is the document end indicator implicit?

6.63.2.4 yaml_mark_t yaml_document_s::end_mark

The end of the document.

6.63.2.5 struct { ... } yaml_document_s::nodes

6.63.2.6 yaml_node_t* yaml_document_s::start

The beginning of the stack.

6.63.2.7 yaml_tag_directive_t* yaml_document_s::start

The beginning of the tag directives list.

6.63.2.8 int yaml_document_s::start_implicit

Is the document start indicator implicit?

6.63.2.9 yaml_mark_t yaml_document_s::start_mark

The beginning of the document.

6.63.2.10 struct { ... } yaml_document_s::tag_directives

6.63.2.11 yaml_node_t* yaml_document_s::top

The top of the stack.

6.63.2.12 yaml_version_directive_t* yaml_document_s::version_directive

The version directive.

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/yaml.h

6.64 yaml_emitter_s Struct Reference

`#include <yaml.h>`

Public Attributes

- unsigned char * buffer
- size_t size
- size_t * size_written

- struct {
  unsigned char * buffer
  size_t size
  size_t * size_written
  } string

- FILE * file
- yaml_char_t * start
- yaml_char_t * end
- yaml_char_t * pointer
- yaml_char_t * last
- unsigned char * start
- unsigned char * end
- unsigned char * pointer
- unsigned char * last
- yaml_emitter_state_t * start
- yaml_emitter_state_t * end
- yaml_emitter_state_t * top
- yaml_event_t * start
- yaml_event_t * end
- yaml_event_t * head
- yaml_event_t * tail
- int * start
- int * end
- int * top
- yaml_tag_directive_t * start
- yaml_tag_directive_t * end
- yaml_tag_directive_t * top
- yaml_char_t * anchor
- size_t anchor_length
- int alias
- yaml_char_t * handle
- size_t handle_length
- yaml_char_t * suffix
- size_t suffix_length
- yaml_char_t * value
- size_t length
- int multiline
- int flow_plain_allowed
- int block_plain_allowed
- int single_quoted_allowed
- int block_allowed
- yaml_scalar_style_t style
- int references
- int anchor
- int serialized

Error handling

- yaml_error_type_t error
- const char * problem

Writer stuff

- yaml_write_handler_t * write_handler
- void * write_handler_data

- union {
  struct {
  unsigned char * buffer
  size_t size
  size_t * size_written
  } string
  FILE * file
  } output

- struct {
  yaml_char_t * start
  yaml_char_t * end
  yaml_char_t * pointer
  yaml_char_t * last
  } buffer

- struct {
  unsigned char * start
  unsigned char * end
  unsigned char * pointer
  unsigned char * last
  } raw_buffer

- yaml_encoding_t encoding

Emitter stuff

- int canonical
- int best_indent
- int best_width
- int unicode
- yaml_break_t line_break
- struct {
  yaml_emitter_state_t * start
  yaml_emitter_state_t * end
  yaml_emitter_state_t * top
  } states

- yaml_emitter_state_t state
- struct {
  yaml_event_t * start
  yaml_event_t * end
  yaml_event_t * head
  yaml_event_t * tail
  } events

- struct {
  int * start
  int * end
  int * top
  } indents

- struct {
  yaml_tag_directive_t * start
  yaml_tag_directive_t * end
  yaml_tag_directive_t * top
  } tag_directives

- int indent
- int flow_level

- int root_context
- int sequence_context
- int mapping_context
- int simple_key_context
- int line
- int column
- int whitespace
- int indention
- int open_ended
- struct {
  yaml_char_t * anchor
  size_t anchor_length
  int alias
  } anchor_data

- struct {
  yaml_char_t * handle
  size_t handle_length
  yaml_char_t * suffix
  size_t suffix_length
  } tag_data

- struct {
  yaml_char_t * value
  size_t length
  int multiline
  int flow_plain_allowed
  int block_plain_allowed
  int single_quoted_allowed
  int block_allowed
  yaml_scalar_style_t style
  } scalar_data

Dumper stuff

- int opened
- int closed
- struct {
  int references
  int anchor
  int serialized
  } anchors

- int last_anchor_id
- yaml_document_t * document

6.64.1 Detailed Description

The emitter structure.

All members are internal. Manage the structure using the `yaml_emitter_` family of functions.

6.64.2 Member Data Documentation

6.64.2.1 int yaml_emitter_s::alias

Is it an alias?

6.64.2.2 yaml_char_t* yaml_emitter_s::anchor

The anchor value.

6.64.2.3 int yaml_emitter_s::anchor

The anchor id.

6.64.2.4 struct { ... } yaml_emitter_s::anchor_data

6.64.2.5 size_t yaml_emitter_s::anchor_length

The anchor length.

6.64.2.6 struct { ... } * yaml_emitter_s::anchors

6.64.2.7 int yaml_emitter_s::best_indent

The number of indentation spaces.

6.64.2.8 int yaml_emitter_s::best_width

The preferred width of the output lines.

6.64.2.9 int yaml_emitter_s::block_allowed

Can the scalar be expressed in the literal or folded styles?

6.64.2.10 int yaml_emitter_s::block_plain_allowed

Can the scalar be expressed in the block plain style?

6.64.2.11 unsigned char* yaml_emitter_s::buffer

The buffer pointer.

6.64.2.12 struct { ... } yaml_emitter_s::buffer

6.64.2.13 int yaml_emitter_s::canonical

If the output is in the canonical style?

6.64.2.14 int yaml_emitter_s::closed

If the stream was already closed?

6.64.2.15 int yaml_emitter_s::column

The current column.

6.64.2.16 yaml_document_t* yaml_emitter_s::document

The currently emitted document.

6.64.2.17 yaml_encoding_t yaml_emitter_s::encoding

The stream encoding.

6.64.2.18 yaml_char_t* yaml_emitter_s::end

The end of the buffer.

6.64.2.19 unsigned char* yaml_emitter_s::end

The end of the buffer.

6.64.2.20 yaml_emitter_state_t* yaml_emitter_s::end

The end of the stack.

6.64.2.21 yaml_event_t* yaml_emitter_s::end

The end of the event queue.

6.64.2.22 int* yaml_emitter_s::end

The end of the stack.

6.64.2.23 yaml_tag_directive_t* yaml_emitter_s::end

The end of the list.

6.64.2.24 yaml_error_type_t yaml_emitter_s::error

Error type.

6.64.2.25 struct { ... } yaml_emitter_s::events

6.64.2.26 FILE* yaml_emitter_s::file

File output data.

6.64.2.27 int yaml_emitter_s::flow_level

The current flow level.

6.64.2.28 int yaml_emitter_s::flow_plain_allowed

Can the scalar be expessed in the flow plain style?

6.64.2.29 yaml_char_t* yaml_emitter_s::handle

The tag handle.

6.64.2.30 size_t yaml_emitter_s::handle_length

The tag handle length.

6.64.2.31 yaml_event_t* yaml_emitter_s::head

The head of the event queue.

6.64.2.32 int yaml_emitter_s::indent

The current indentation level.

6.64.2.33 int yaml_emitter_s::indention

If the last character was an indentation character (' ', '-', '?', ':')?

6.64.2.34 struct { ... } yaml_emitter_s::indents

6.64.2.35 yaml_char_t* yaml_emitter_s::last

The last filled position of the buffer.

6.64.2.36 unsigned char* yaml_emitter_s::last

The last filled position of the buffer.

6.64.2.37 int yaml_emitter_s::last_anchor_id

The last assigned anchor id.

6.64.2.38 size_t yaml_emitter_s::length

The scalar length.

6.64.2.39 int yaml_emitter_s::line

The current line.

6.64.2.40 yaml_break_t yaml_emitter_s::line_break

The preferred line break.

6.64.2.41 int yaml_emitter_s::mapping_context

Is it a mapping context?

6.64.2.42 int yaml_emitter_s::multiline

Does the scalar contain line breaks?

6.64.2.43 int yaml_emitter_s::open_ended

If an explicit document end is required?

6.64.2.44 int yaml_emitter_s::opened

If the stream was already opened?

6.64.2.45 union { ... } yaml_emitter_s::output

6.64.2.46 yaml_char_t* yaml_emitter_s::pointer

The current position of the buffer.

6.64.2.47 unsigned char* yaml_emitter_s::pointer

The current position of the buffer.

6.64.2.48 const char* yaml_emitter_s::problem

Error description.

6.64.2.49 struct { ... } yaml_emitter_s::raw_buffer

6.64.2.50 int yaml_emitter_s::references

The number of references.

6.64.2.51 int yaml_emitter_s::root_context

Is it the document root context?

6.64.2.52 struct { ... } yaml_emitter_s::scalar_data

6.64.2.53 int yaml_emitter_s::sequence_context

Is it a sequence context?

6.64.2.54 int yaml_emitter_s::serialized

If the node has been emitted?

6.64.2.55 int yaml_emitter_s::simple_key_context

Is it a simple mapping key context?

6.64.2.56 int yaml_emitter_s::single_quoted_allowed

Can the scalar be expressed in the single quoted style?

6.64.2.57 size_t yaml_emitter_s::size

The buffer size.

6.64.2.58 size_t* yaml_emitter_s::size_written

The number of written bytes.

6.64.2.59 yaml_char_t* yaml_emitter_s::start

The beginning of the buffer.

6.64.2.60 unsigned char* yaml_emitter_s::start

The beginning of the buffer.

6.64.2.61 yaml_emitter_state_t* yaml_emitter_s::start

The beginning of the stack.

6.64.2.62 yaml_event_t* yaml_emitter_s::start

The beginning of the event queue.

6.64.2.63 int* yaml_emitter_s::start

The beginning of the stack.

6.64.2.64 yaml_tag_directive_t* yaml_emitter_s::start

The beginning of the list.

6.64.2.65 yaml_emitter_state_t yaml_emitter_s::state

The current emitter state.

6.64.2.66 struct { ... } yaml_emitter_s::states

6.64.2.67 struct { ... } yaml_emitter_s::string

6.64.2.68 yaml_scalar_style_t yaml_emitter_s::style

The output style.

6.64.2.69 yaml_char_t* yaml_emitter_s::suffix

The tag suffix.

6.64.2.70 size_t yaml_emitter_s::suffix_length

The tag suffix length.

6.64.2.71 struct { ... } yaml_emitter_s::tag_data

6.64.2.72 struct { ... } yaml_emitter_s::tag_directives

6.64.2.73 yaml_event_t* yaml_emitter_s::tail

The tail of the event queue.

6.64.2.74 yaml_emitter_state_t* yaml_emitter_s::top

The top of the stack.

6.64.2.75 int* yaml_emitter_s::top

The top of the stack.

6.64.2.76 yaml_tag_directive_t* yaml_emitter_s::top

The top of the list.

6.64.2.77 int yaml_emitter_s::unicode

Allow unescaped non-ASCII characters?

6.64.2.78 yaml_char_t* yaml_emitter_s::value

The scalar value.

6.64.2.79 int yaml_emitter_s::whitespace

If the last character was a whitespace?

6.64.2.80 yaml_write_handler_t* yaml_emitter_s::write_handler

Write handler.

6.64.2.81 void* yaml_emitter_s::write_handler_data

A pointer for passing to the white handler.

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/yaml.h

6.65 yaml_event_s Struct Reference

`#include <yaml.h>`

Public Attributes

- yaml_event_type_t type
- union {
  struct {
  yaml_encoding_t encoding
  } stream_start
  struct {
  yaml_version_directive_t * version_directive
  struct {
  yaml_tag_directive_t * start
  yaml_tag_directive_t * end
  } tag_directives
  int implicit
  } document_start
  struct {
  int implicit
  } document_end
  struct {
  yaml_char_t * anchor
  } alias
  struct {
  yaml_char_t * anchor
  yaml_char_t * tag
  yaml_char_t * value
  size_t length
  int plain_implicit
  int quoted_implicit
  yaml_scalar_style_t style
  } scalar
  struct {
  yaml_char_t * anchor
  yaml_char_t * tag
  int implicit
  yaml_sequence_style_t style
  } sequence_start
  struct {
  yaml_char_t * anchor
  yaml_char_t * tag
  int implicit
  yaml_mapping_style_t style
  } mapping_start
  } data
- yaml_mark_t start_mark
- yaml_mark_t end_mark

6.65.1 Detailed Description

The event structure.

6.65.2 Member Data Documentation

6.65.2.1 struct { ... } yaml_event_s::alias

6.65.2.2 yaml_char_t* yaml_event_s::anchor

The anchor.

6.65.2.3 union { ... } yaml_event_s::data

6.65.2.4 struct { ... } yaml_event_s::document_end

6.65.2.5 struct { ... } yaml_event_s::document_start

6.65.2.6 yaml_encoding_t yaml_event_s::encoding

The document encoding.

6.65.2.7 yaml_tag_directive_t* yaml_event_s::end

The end of the tag directives list.

6.65.2.8 yaml_mark_t yaml_event_s::end_mark

The end of the event.

6.65.2.9 int yaml_event_s::implicit

Is the document indicator implicit?

Is the document end indicator implicit?

Is the tag optional?

6.65.2.10 size_t yaml_event_s::length

The length of the scalar value.

6.65.2.11 struct { ... } yaml_event_s::mapping_start

6.65.2.12 int yaml_event_s::plain_implicit

Is the tag optional for the plain style?

6.65.2.13 int yaml_event_s::quoted_implicit

Is the tag optional for any non-plain style?

6.65.2.14 struct { ... } yaml_event_s::scalar

6.65.2.15 struct { ... } yaml_event_s::sequence_start

6.65.2.16 yaml_tag_directive_t* yaml_event_s::start

The beginning of the tag directives list.

6.65.2.17 yaml_mark_t yaml_event_s::start_mark

The beginning of the event.

6.65.2.18 struct { ... } yaml_event_s::stream_start

6.65.2.19 yaml_scalar_style_t yaml_event_s::style

The scalar style.

6.65.2.20 yaml_sequence_style_t yaml_event_s::style

The sequence style.

6.65.2.21 yaml_mapping_style_t yaml_event_s::style

The mapping style.

6.65.2.22 yaml_char_t* yaml_event_s::tag

The tag.

6.65.2.23 struct { ... } yaml_event_s::tag_directives

6.65.2.24 yaml_event_type_t yaml_event_s::type

The event type.

6.65.2.25 yaml_char_t* yaml_event_s::value

The scalar value.

6.65.2.26 yaml_version_directive_t* yaml_event_s::version_directive

The version directive.

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/yaml.h

6.66 yaml_mark_s Struct Reference

`#include <yaml.h>`

Public Attributes

- size_t index
- size_t line
- size_t column

6.66.1 Detailed Description

The pointer position.

6.66.2 Member Data Documentation

6.66.2.1 size_t yaml_mark_s::column

The position column.

6.66.2.2 size_t yaml_mark_s::index

The position index.

6.66.2.3 size_t yaml_mark_s::line

The position line.

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/yaml.h

6.67 yaml_node_pair_s Struct Reference

```
#include <yaml.h>
```

Public Attributes

- int key
- int value

6.67.1 Detailed Description

An element of a mapping node.

6.67.2 Member Data Documentation

6.67.2.1 int yaml_node_pair_s::key

The key of the element.

6.67.2.2 int yaml_node_pair_s::value

The value of the element.

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/yaml.h

6.68 yaml_node_s Struct Reference

`#include <yaml.h>`

Public Attributes

- yaml_node_type_t type
- yaml_char_t * tag
- union {
  struct {
  yaml_char_t * value
  size_t length
  yaml_scalar_style_t style
  } scalar
  struct {
  struct {
  yaml_node_item_t * start
  yaml_node_item_t * end
  yaml_node_item_t * top
  } items
  yaml_sequence_style_t style
  } sequence
  struct {
  struct {
  yaml_node_pair_t * start
  yaml_node_pair_t * end
  yaml_node_pair_t * top
  } pairs
  yaml_mapping_style_t style
  } mapping
  } data
- yaml_mark_t start_mark
- yaml_mark_t end_mark

6.68.1 Detailed Description

The node structure.

6.68.2 Member Data Documentation

6.68.2.1 union { ... } yaml_node_s::data

6.68.2.2 yaml_node_item_t* yaml_node_s::end

The end of the stack.

6.68.2.3 yaml_node_pair_t* yaml_node_s::end

The end of the stack.

6.68.2.4 yaml_mark_t yaml_node_s::end_mark

The end of the node.

6.68.2.5 struct { ... } yaml_node_s::items

6.68.2.6 size_t yaml_node_s::length

The length of the scalar value.

6.68.2.7 struct { ... } yaml_node_s::mapping

6.68.2.8 struct { ... } yaml_node_s::pairs

6.68.2.9 struct { ... } yaml_node_s::scalar

6.68.2.10 struct { ... } yaml_node_s::sequence

6.68.2.11 yaml_node_item_t* yaml_node_s::start

The beginning of the stack.

6.68.2.12 yaml_node_pair_t* yaml_node_s::start

The beginning of the stack.

6.68.2.13 yaml_mark_t yaml_node_s::start_mark

The beginning of the node.

6.68.2.14 yaml_scalar_style_t yaml_node_s::style

The scalar style.

6.68.2.15 yaml_sequence_style_t yaml_node_s::style

The sequence style.

6.68.2.16 yaml_mapping_style_t yaml_node_s::style

The mapping style.

6.68.2.17 yaml_char_t* yaml_node_s::tag

The node tag.

6.68.2.18 yaml_node_item_t* yaml_node_s::top

The top of the stack.

6.68.2.19 yaml_node_pair_t* yaml_node_s::top

The top of the stack.

6.68.2.20 yaml_node_type_t yaml_node_s::type

The node type.

6.68.2.21 yaml_char_t* yaml_node_s::value

The scalar value.

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/yaml.h

6.69 yaml_parser_s Struct Reference

`#include <yaml.h>`

Public Attributes

- const unsigned char * start
- const unsigned char * end
- const unsigned char * current
- struct {
  const unsigned char * start
  const unsigned char * end
  const unsigned char * current
  } string

- FILE * file
- yaml_char_t * start
- yaml_char_t * end
- yaml_char_t * pointer
- yaml_char_t * last
- unsigned char * start
- unsigned char * end
- unsigned char * pointer
- unsigned char * last
- yaml_token_t * start
- yaml_token_t * end
- yaml_token_t * head
- yaml_token_t * tail
- int * start
- int * end
- int * top
- yaml_simple_key_t * start

- yaml_simple_key_t * end
- yaml_simple_key_t * top
- yaml_parser_state_t * start
- yaml_parser_state_t * end
- yaml_parser_state_t * top
- yaml_mark_t * start
- yaml_mark_t * end
- yaml_mark_t * top
- yaml_tag_directive_t * start
- yaml_tag_directive_t * end
- yaml_tag_directive_t * top
- yaml_alias_data_t * start
- yaml_alias_data_t * end
- yaml_alias_data_t * top

Error handling

- yaml_error_type_t error
- const char * problem
- size_t problem_offset
- int problem_value
- yaml_mark_t problem_mark
- const char * context
- yaml_mark_t context_mark

Reader stuff

- yaml_read_handler_t * read_handler
- void * read_handler_data
- union {
    struct {
      const unsigned char * start
      const unsigned char * end
      const unsigned char * current
    } string
    FILE * file
  } input

- int eof
- struct {
    yaml_char_t * start
    yaml_char_t * end
    yaml_char_t * pointer
    yaml_char_t * last
  } buffer

- size_t unread
- struct {
    unsigned char * start
    unsigned char * end
    unsigned char * pointer
    unsigned char * last
  } raw_buffer

- yaml_encoding_t encoding
- size_t offset
- yaml_mark_t mark

Scanner stuff

- int stream_start_produced
- int stream_end_produced
- int flow_level
- struct {
    yaml_token_t * start
    yaml_token_t * end
    yaml_token_t * head
    yaml_token_t * tail
  } tokens

- size_t tokens_parsed
- int token_available
- struct {
    int * start
    int * end
    int * top
  } indents

- int indent
- int simple_key_allowed
- struct {
    yaml_simple_key_t * start
    yaml_simple_key_t * end
    yaml_simple_key_t * top
  } simple_keys

Parser stuff

- struct {
    yaml_parser_state_t * start
    yaml_parser_state_t * end
    yaml_parser_state_t * top
  } states

- yaml_parser_state_t state
- struct {
    yaml_mark_t * start
    yaml_mark_t * end
    yaml_mark_t * top
  } marks

- struct {
    yaml_tag_directive_t * start
    yaml_tag_directive_t * end
    yaml_tag_directive_t * top
  } tag_directives

Dumper stuff

- struct {
    yaml_alias_data_t * start
    yaml_alias_data_t * end
    yaml_alias_data_t * top
  } aliases

- yaml_document_t * document

6.69.1 Detailed Description

The parser structure.

All members are internal. Manage the structure using the `yaml_parser_` family of functions.

6.69.2 Member Data Documentation

6.69.2.1 struct { ... } yaml_parser_s::aliases

6.69.2.2 struct { ... } yaml_parser_s::buffer

6.69.2.3 const char* yaml_parser_s::context

The error context.

6.69.2.4 yaml_mark_t yaml_parser_s::context_mark

The context position.

6.69.2.5 const unsigned char* yaml_parser_s::current

The string current position.

6.69.2.6 yaml_document_t* yaml_parser_s::document

The currently parsed document.

6.69.2.7 yaml_encoding_t yaml_parser_s::encoding

The input encoding.

6.69.2.8 const unsigned char* yaml_parser_s::end

The string end pointer.

6.69.2.9 yaml_char_t* yaml_parser_s::end

The end of the buffer.

6.69.2.10 unsigned char* yaml_parser_s::end

The end of the buffer.

6.69.2.11 yaml_token_t* yaml_parser_s::end

The end of the tokens queue.

6.69.2.12 int* yaml_parser_s::end

The end of the stack.

6.69.2.13 yaml_simple_key_t* yaml_parser_s::end

The end of the stack.

6.69.2.14 yaml_parser_state_t* yaml_parser_s::end

The end of the stack.

6.69.2.15 yaml_mark_t* yaml_parser_s::end

The end of the stack.

6.69.2.16 yaml_tag_directive_t* yaml_parser_s::end

The end of the list.

6.69.2.17 yaml_alias_data_t* yaml_parser_s::end

The end of the list.

6.69.2.18 int yaml_parser_s::eof

EOF flag

6.69.2.19 yaml_error_type_t yaml_parser_s::error

Error type.

6.69.2.20 FILE* yaml_parser_s::file

File input data.

6.69.2.21 int yaml_parser_s::flow_level

The number of unclosed '[' and '{' indicators.

6.69.2.22 yaml_token_t* yaml_parser_s::head

The head of the tokens queue.

6.69.2.23 int yaml_parser_s::indent

The current indentation level.

6.69.2.24 struct { ... } yaml_parser_s::indents

6.69.2.25 union { ... } yaml_parser_s::input

6.69.2.26 yaml_char_t* yaml_parser_s::last

The last filled position of the buffer.

6.69.2.27 unsigned char* yaml_parser_s::last

The last filled position of the buffer.

6.69.2.28 yaml_mark_t yaml_parser_s::mark

The mark of the current position.

6.69.2.29 struct { ... } yaml_parser_s::marks

6.69.2.30 size_t yaml_parser_s::offset

The offset of the current position (in bytes).

6.69.2.31 yaml_char_t* yaml_parser_s::pointer

The current position of the buffer.

6.69.2.32 unsigned char* yaml_parser_s::pointer

The current position of the buffer.

6.69.2.33 const char* yaml_parser_s::problem

Error description.

6.69.2.34 yaml_mark_t yaml_parser_s::problem_mark

The problem position.

6.69.2.35 size_t yaml_parser_s::problem_offset

The byte about which the problem occured.

6.69.2.36 int yaml_parser_s::problem_value

The problematic value (`-1` is none).

6.69.2.37 struct { ... } yaml_parser_s::raw_buffer

6.69.2.38 yaml_read_handler_t* yaml_parser_s::read_handler

Read handler.

6.69.2.39 void* yaml_parser_s::read_handler_data

A pointer for passing to the read handler.

6.69.2.40 int yaml_parser_s::simple_key_allowed

May a simple key occur at the current position?

6.69.2.41 struct { ... } yaml_parser_s::simple_keys

6.69.2.42 const unsigned char* yaml_parser_s::start

The string start pointer.

6.69.2.43 yaml_char_t* yaml_parser_s::start

The beginning of the buffer.

6.69.2.44 unsigned char* yaml_parser_s::start

The beginning of the buffer.

6.69.2.45 yaml_token_t* yaml_parser_s::start

The beginning of the tokens queue.

6.69.2.46 int* yaml_parser_s::start

The beginning of the stack.

6.69.2.47 yaml_simple_key_t* yaml_parser_s::start

The beginning of the stack.

6.69.2.48 yaml_parser_state_t* yaml_parser_s::start

The beginning of the stack.

6.69.2.49 yaml_mark_t* yaml_parser_s::start

The beginning of the stack.

6.69.2.50 yaml_tag_directive_t* yaml_parser_s::start

The beginning of the list.

6.69.2.51 yaml_alias_data_t* yaml_parser_s::start

The beginning of the list.

6.69.2.52 yaml_parser_state_t yaml_parser_s::state

The current parser state.

6.69.2.53 struct { ... } yaml_parser_s::states

6.69.2.54 int yaml_parser_s::stream_end_produced

Have we reached the end of the input stream?

6.69.2.55 int yaml_parser_s::stream_start_produced

Have we started to scan the input stream?

6.69.2.56 struct { ... } yaml_parser_s::string

6.69.2.57 struct { ... } yaml_parser_s::tag_directives

6.69.2.58 yaml_token_t* yaml_parser_s::tail

The tail of the tokens queue.

6.69.2.59 int yaml_parser_s::token_available

6.69.2.60 struct { ... } yaml_parser_s::tokens

6.69.2.61 size_t yaml_parser_s::tokens_parsed

The number of tokens fetched from the queue.

6.69.2.62 int* yaml_parser_s::top

The top of the stack.

6.69.2.63 yaml_simple_key_t* yaml_parser_s::top

The top of the stack.

6.69.2.64 yaml_parser_state_t* yaml_parser_s::top

The top of the stack.

6.69.2.65 yaml_mark_t* yaml_parser_s::top

The top of the stack.

6.69.2.66 yaml_tag_directive_t* yaml_parser_s::top

The top of the list.

6.69.2.67 yaml_alias_data_t* yaml_parser_s::top

The top of the list.

6.69.2.68 size_t yaml_parser_s::unread

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/yaml.h

6.70 yaml_simple_key_s Struct Reference

`#include <yaml.h>`

Public Attributes

- int possible
- int required
- size_t token_number
- yaml_mark_t mark

6.70.1 Detailed Description

This structure holds information about a potential simple key.

6.70.2 Member Data Documentation

6.70.2.1 yaml_mark_t yaml_simple_key_s::mark

The position mark.

6.70.2.2 int yaml_simple_key_s::possible

Is a simple key possible?

6.70.2.3 int yaml_simple_key_s::required

Is a simple key required?

6.70.2.4 size_t yaml_simple_key_s::token_number

The number of the token.

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/yaml.h

6.71 yaml_string_t Struct Reference

`#include <yaml_private.h>`

Public Attributes

- yaml_char_t * start
- yaml_char_t * end
- yaml_char_t * pointer

6.71.1 Member Data Documentation

6.71.1.1 yaml_char_t* yaml_string_t::end

6.71.1.2 yaml_char_t* yaml_string_t::pointer

6.71.1.3 yaml_char_t* yaml_string_t::start

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/yaml_private.h

6.72 yaml_tag_directive_s Struct Reference

`#include <yaml.h>`

Public Attributes

- yaml_char_t * handle
- yaml_char_t * prefix

6.72.1 Detailed Description

The tag directive data.

6.72.2 Member Data Documentation

6.72.2.1 yaml_char_t* yaml_tag_directive_s::handle

The tag handle.

6.72.2.2 yaml_char_t* yaml_tag_directive_s::prefix

The tag prefix.

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/yaml.h

6.73 yaml_token_s Struct Reference

`#include <yaml.h>`

Public Attributes

- yaml_token_type_t type
- union {
  struct {
  yaml_encoding_t encoding
  } stream_start
  struct {
  yaml_char_t * value
  } alias
  struct {
  yaml_char_t * value
  } anchor
  struct {
  yaml_char_t * handle
  yaml_char_t * suffix
  } tag
  struct {
  yaml_char_t * value
  size_t length
  yaml_scalar_style_t style
  } scalar
  struct {
  int major
  int minor
  } version_directive
  struct {
  yaml_char_t * handle
  yaml_char_t * prefix
  } tag_directive
  } data

- yaml_mark_t start_mark
- yaml_mark_t end_mark

6.73.1 Detailed Description

The token structure.

6.73.2 Member Data Documentation

6.73.2.1 struct { ... } yaml_token_s::alias

6.73.2.2 struct { ... } yaml_token_s::anchor

6.73.2.3 union { ... } yaml_token_s::data

6.73.2.4 yaml_encoding_t yaml_token_s::encoding

The stream encoding.

6.73.2.5 yaml_mark_t yaml_token_s::end_mark

The end of the token.

6.73.2.6 yaml_char_t* yaml_token_s::handle

The tag handle.

6.73.2.7 size_t yaml_token_s::length

The length of the scalar value.

6.73.2.8 int yaml_token_s::major

The major version number.

6.73.2.9 int yaml_token_s::minor

The minor version number.

6.73.2.10 yaml_char_t* yaml_token_s::prefix

The tag prefix.

6.73.2.11 struct { ... } yaml_token_s::scalar

6.73.2.12 yaml_mark_t yaml_token_s::start_mark

The beginning of the token.

6.73.2.13 struct { ... } yaml_token_s::stream_start

6.73.2.14 yaml_scalar_style_t yaml_token_s::style

The scalar style.

6.73.2.15 yaml_char_t* yaml_token_s::suffix

The tag suffix.

6.73.2.16 struct { ... } yaml_token_s::tag

6.73.2.17 struct { ... } yaml_token_s::tag_directive

6.73.2.18 yaml_token_type_t yaml_token_s::type

The token type.

6.73.2.19 yaml_char_t* yaml_token_s::value

The alias value.

The anchor value.

The scalar value.

6.73.2.20 struct { ... } yaml_token_s::version_directive

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/yaml.h

6.74 yaml_version_directive_s Struct Reference

`#include <yaml.h>`

Public Attributes

- int major
- int minor

6.74.1 Detailed Description

The version directive data.

6.74.2 Member Data Documentation

6.74.2.1 int yaml_version_directive_s::major

The major version number.

6.74.2.2 int yaml_version_directive_s::minor

The minor version number.

The documentation for this struct was generated from the following file:

- /Users/aladshaw3/projects/ecosystem/include/yaml.h

6.75 YamlWrapper Class Reference

`#include <yaml_wrapper.h>`

Public Member Functions

- YamlWrapper ()
- ~YamlWrapper ()
- YamlWrapper (const YamlWrapper &yaml)
- YamlWrapper (std::string key, const Document &doc)
- YamlWrapper & operator= (const YamlWrapper &yaml)
- Document & operator() (const std::string key)
- Document operator() (const std::string key) const
- std::map< std::string, Document > & getDocMap ()
- Document & getDocument (std::string key)
- std::map< std::string, Document >::const_iterator end () const

- std::map< std::string, Document >::iterator end ()
- std::map< std::string, Document >::const_iterator begin () const
- std::map< std::string, Document >::iterator begin ()
- void clear ()
- void resetKeys ()
- void changeKey (std::string oldKey, std::string newKey)
- void revalidateAllKeys ()
- void DisplayContents ()
- void addDocKey (std::string key)
- void copyAnchor2Alias (std::string alias, Document &ref)
- int size ()
- Document & getAnchoredDoc (std::string alias)
- Document & getDocFromHeadAlias (std::string alias)
- Document & getDocFromSubAlias (std::string alias)

Private Attributes

- std::map< std::string, Document > Doc_Map

6.75.1 Constructor & Destructor Documentation

6.75.1.1 YamlWrapper::YamlWrapper ( )

6.75.1.2 YamlWrapper::~YamlWrapper ( )

6.75.1.3 YamlWrapper::YamlWrapper (const YamlWrapper & *yaml*)

6.75.1.4 YamlWrapper::YamlWrapper (std::string *key,* const Document & *doc*)

6.75.2 Member Function Documentation

6.75.2.1 void YamlWrapper::addDocKey (std::string *key*)

6.75.2.2 std::map< std::string, Document >::const_iterator YamlWrapper::begin ( ) const

6.75.2.3 std::map< std::string, Document >::iterator YamlWrapper::begin ( )

6.75.2.4 void YamlWrapper::changeKey (std::string *oldKey,* std::string *newKey*)

6.75.2.5 void YamlWrapper::clear ( )

6.75.2.6 void YamlWrapper::copyAnchor2Alias (std::string *alias,* Document & *ref*)

6.75.2.7 void YamlWrapper::DisplayContents ( )

6.75.2.8 std::map< std::string, Document >::const_iterator YamlWrapper::end ( ) const

6.75.2.9 std::map< std::string, Document >::iterator YamlWrapper::end ( )

6.75.2.10 Document & YamlWrapper::getAnchoredDoc (std::string *alias*)

6.75.2.11 Document & YamlWrapper::getDocFromHeadAlias (std::string *alias*)

6.75.2.12 Document & YamlWrapper::getDocFromSubAlias (std::string *alias*)

6.75.2.13 std::map< std::string, Document > & YamlWrapper::getDocMap ( )

6.75.2.14 Document & YamlWrapper::getDocument (std::string *key*)

6.75.2.15 Document & YamlWrapper::operator() (const std::string *key*)

6.75.2.16 Document YamlWrapper::operator() (const std::string *key*) const

6.75.2.17 YamlWrapper & YamlWrapper::operator= (const YamlWrapper & *yaml*)

6.75.2.18 void YamlWrapper::resetKeys ( )

6.75.2.19 void YamlWrapper::revalidateAllKeys ( )

6.75.2.20 int YamlWrapper::size ( )

6.75.3 Member Data Documentation

6.75.3.1 std::map<std::string, Document> YamlWrapper::Doc_Map [private]

The documentation for this class was generated from the following files:

- /Users/aladshaw3/projects/ecosystem/include/yaml_wrapper.h
- /Users/aladshaw3/projects/ecosystem/src/yaml_wrapper.cpp

Chapter 7

File Documentation

7.1 /Users/aladshaw3/projects/ecosystem/include/config.h File Reference

Macros

- #define YAML_VERSION_MAJOR 0
- #define YAML_VERSION_MINOR 1
- #define YAML_VERSION_PATCH 5
- #define YAML_VERSION_STRING "0.1.5"

7.1.1 Macro Definition Documentation

7.1.1.1 #define YAML_VERSION_MAJOR 0

7.1.1.2 #define YAML_VERSION_MINOR 1

7.1.1.3 #define YAML_VERSION_PATCH 5

7.1.1.4 #define YAML_VERSION_STRING "0.1.5"

7.2 /Users/aladshaw3/projects/ecosystem/include/dogfish.h File Reference

```
#include "finch.h"
#include "mola.h"
```

Classes

- struct DOGFISH_PARAM
- struct DOGFISH_DATA

Functions

- void print2file_species_header (FILE *Output, DOGFISH_DATA *dog_dat, int i)
- void print2file_DOGFISH_header (DOGFISH_DATA *dog_dat)
- void print2file_DOGFISH_result_old (DOGFISH_DATA *dog_dat)
- void print2file_DOGFISH_result_new (DOGFISH_DATA *dog_dat)
- double default_Retardation (int i, int l, const void *data)

- double default_IntraDiffusion (int i, int l, const void *data)
- double default_FilmMTCoeff (int i, const void *data)
- double default_SurfaceConcentration (int i, const void *data)
- int setup_DOGFISH_DATA (FILE *file, double(*eval_R)(int i, int l, const void *user_data), double(*eval_DI)(int i, int l, const void *user_data), double(*eval_kf)(int i, const void *user_data), double(*eval_qs)(int i, const void *user_data), const void *user_data, DOGFISH_DATA *dog_dat)
- int DOGFISH_Executioner (DOGFISH_DATA *dog_dat)
- int set_DOGFISH_ICs (DOGFISH_DATA *dog_dat)
- int set_DOGFISH_timestep (DOGFISH_DATA *dog_dat)
- int DOGFISH_preprocesses (DOGFISH_DATA *dog_dat)
- int set_DOGFISH_params (const void *user_data)
- int DOGFISH_postprocesses (DOGFISH_DATA *dog_dat)
- int DOGFISH_reset (DOGFISH_DATA *dog_dat)
- int DOGFISH (DOGFISH_DATA *dog_dat)
- int DOGFISH_TESTS ()

7.2.1 Function Documentation

7.2.1.1 double default_FilmMTCoeff (int *i,* const void * *data*)

7.2.1.2 double default_IntraDiffusion (int *i,* int *l,* const void * *data*)

7.2.1.3 double default_Retardation (int *i,* int *l,* const void * *data*)

7.2.1.4 double default_SurfaceConcentration (int *i,* const void * *data*)

7.2.1.5 int DOGFISH (**DOGFISH_DATA** * *dog_dat*)

7.2.1.6 int DOGFISH_Executioner (**DOGFISH_DATA** * *dog_dat*)

7.2.1.7 int DOGFISH_postprocesses (**DOGFISH_DATA** * *dog_dat*)

7.2.1.8 int DOGFISH_preprocesses (**DOGFISH_DATA** * *dog_dat*)

7.2.1.9 int DOGFISH_reset (**DOGFISH_DATA** * *dog_dat*)

7.2.1.10 int DOGFISH_TESTS ( )

7.2.1.11 void print2file_DOGFISH_header (**DOGFISH_DATA** * *dog_dat*)

7.2.1.12 void print2file_DOGFISH_result_new (**DOGFISH_DATA** * *dog_dat*)

7.2.1.13 void print2file_DOGFISH_result_old (**DOGFISH_DATA** * *dog_dat*)

7.2.1.14 void print2file_species_header (FILE * *Output,* **DOGFISH_DATA** * *dog_dat,* int *i*)

7.2.1.15 int set_DOGFISH_ICs (**DOGFISH_DATA** * *dog_dat*)

7.2.1.16 int set_DOGFISH_params (const void * *user_data*)

7.2.1.17 int set_DOGFISH_timestep (**DOGFISH_DATA** * *dog_dat*)

7.2.1.18 int setup_DOGFISH_DATA (FILE * *file,* double(*)(int i, int l, const void *user_data) *eval_R,* double(*)(int i, int l, const void *user_data) *eval_DI,* double(*)(int i, const void *user_data) *eval_kf,* double(*)(int i, const void *user_data) *eval_qs,* const void * *user_data,* **DOGFISH_DATA** * *dog_dat*)

7.3 /Users/aladshaw3/projects/ecosystem/include/eel.h File Reference

```
#include <stdio.h>
#include <math.h>
#include <iostream>
#include <fstream>
#include <stdlib.h>
#include <vector>
#include <time.h>
#include <float.h>
#include <string>
#include "error.h"
```

Classes

- class Atom
- class PeriodicTable

Functions

- int EEL_TESTS ()

7.3.1 Function Documentation

7.3.1.1 int EEL_TESTS ( )

7.4 /Users/aladshaw3/projects/ecosystem/include/egret.h File Reference

```
#include "macaw.h"
```

Classes

- struct PURE_GAS
- struct MIXED_GAS

Macros

- #define Rstd 8.3144621
- #define RE3 8.3144621E+3
- #define Po 100.0
- #define Cstd(p, T) ((p)/(Rstd∗T))
- #define CE3(p, T) ((p)/(RE3∗T))
- #define Pstd(c, T) ((c)∗Rstd∗T)
- #define PE3(c, T) ((c)∗RE3∗T)
- #define Nu(mu, rho) ((mu)/(rho))
- #define PSI(T) (0.873143 + (0.000072375∗T))
- #define Dp_ij(Dij, PT) ((PT∗Dij)/Po)
- #define D_ij(MWi, MWj, rhoi, rhoj, mui, muj) ((4.0 / sqrt(2.0)) ∗ pow(((1/MWi)+(1/MWj)),0.5)) / pow((pow((pow((rhoi/(1.385∗mui)),2.0)/MWi),0.25)+ pow((pow((rhoj/(1.385∗muj)),2.0)/MWj),0.25)),2.0)
- #define Mu(muo, To, C, T) (muo ∗ ((To + C)/(T + C)) ∗ pow((T/To),1.5))

- #define D_ii(rhoi, mui) (1.385∗mui/rhoi)
- #define ReNum(u, L, nu) (u∗L/nu)
- #define ScNum(nu, D) (nu/D)
- #define FilmMTCoeff(D, L, Re, Sc) ((D/L)∗(2.0 + (1.1∗pow(Re,0.6)∗pow(Sc,0.3))))

Functions

- int initialize_data (int N, MIXED_GAS ∗gas_dat)
- int set_variables (double PT, double T, double us, double L, std::vector< double > &y, MIXED_GAS ∗gas_dat)
- int calculate_properties (MIXED_GAS ∗gas_dat)
- int EGRET_TESTS ()

7.4.1 Macro Definition Documentation

7.4.1.1 #define CE3(*p, T*) ((p)/(RE3∗T))

7.4.1.2 #define Cstd(*p, T*) ((p)/(Rstd∗T))

7.4.1.3 #define D_ii(*rhoi, mui*) (1.385∗mui/rhoi)

7.4.1.4 #define D_ij(*MWi, MWj, rhoi, rhoj, mui, muj*) ((4.0 / sqrt(2.0)) ∗ pow(((1/MWi)+(1/MWj)),0.5)) / pow((pow((pow((rhoi/(1.385∗mui)),2.0)/MWi),0.25)+ pow((pow((rhoj/(1.385∗muj)),2.0)/MWj),0.25)),2.0)

7.4.1.5 #define Dp_ij(*Dij, PT*) ((PT∗Dij)/Po)

7.4.1.6 #define FilmMTCoeff(*D, L, Re, Sc*) ((D/L)∗(2.0 + (1.1∗pow(Re,0.6)∗pow(Sc,0.3))))

7.4.1.7 #define Mu(*muo, To, C, T*) (muo ∗ ((To + C)/(T + C)) ∗ pow((T/To),1.5))

7.4.1.8 #define Nu(*mu, rho*) ((mu)/(rho))

7.4.1.9 #define PE3(*c, T*) ((c)∗RE3∗T)

7.4.1.10 #define Po 100.0

7.4.1.11 #define PSI(*T*) (0.873143 + (0.000072375∗T))

7.4.1.12 #define Pstd(*c, T*) ((c)∗Rstd∗T)

7.4.1.13 #define RE3 8.3144621E+3

7.4.1.14 #define ReNum(*u, L, nu*) (u∗L/nu)

7.4.1.15 #define Rstd 8.3144621

7.4.1.16 #define ScNum(*nu, D*) (nu/D)

7.4.2 Function Documentation

7.4.2.1 int calculate_properties (MIXED_GAS ∗ *gas_dat*)

7.4.2.2 int EGRET_TESTS ( )

7.4.2.3 int initialize_data (int *N,* MIXED_GAS ∗ *gas_dat*)

7.4.2.4 int set_variables (double *PT*, double *T*, double *us*, double *L*, std::vector< double > & *y*, MIXED_GAS * *gas_dat*)

7.5 /Users/aladshaw3/projects/ecosystem/include/error.h File Reference

```
#include <iostream>
```

Macros

- #define mError(i)

Enumerations

- enum error_type {
  generic_error, file_dne, indexing_error, magpie_reverse_error,
  simulation_fail, invalid_components, invalid_boolean, invalid_molefraction,
  invalid_gas_sum, invalid_solid_sum, scenario_fail, out_of_bounds,
  non_square_matrix, dim_mis_match, empty_matrix, opt_no_support,
  invalid_fraction, ortho_check_fail, unstable_matrix, no_diffusion,
  negative_mass, negative_time, matvec_mis_match, arg_matrix_same,
  singular_matrix, matrix_too_small, invalid_size, nullptr_func,
  invalid_norm, vector_out_of_bounds, zero_vector, tensor_out_of_bounds,
  non_real_edge, nullptr_error, invalid_atom, invalid_proton,
  invalid_neutron, invalid_electron, invalid_valence, string_parse_error,
  unregistered_name, rxn_rate_error, invalid_species, duplicate_variable,
  missing_information, invalid_type, key_not_found, anchor_alias_dne,
  initial_error, not_a_token, read_error, invalid_console_input }

Functions

- void error (int flag)

7.5.1 Macro Definition Documentation

7.5.1.1 #define mError(*i*)

Value:

```
{error(i);          \
std::cout << "Source: " << __FILE__ << "\nLine: " << __LINE__ << std::endl;}
```

7.5.2 Enumeration Type Documentation

7.5.2.1 enum error_type

Enumerator

generic_error

file_dne

indexing_error

magpie_reverse_error

simulation_fail

invalid_components

invalid_boolean
invalid_molefraction
invalid_gas_sum
invalid_solid_sum
scenario_fail
out_of_bounds
non_square_matrix
dim_mis_match
empty_matrix
opt_no_support
invalid_fraction
ortho_check_fail
unstable_matrix
no_diffusion
negative_mass
negative_time
matvec_mis_match
arg_matrix_same
singular_matrix
matrix_too_small
invalid_size
nullptr_func
invalid_norm
vector_out_of_bounds
zero_vector
tensor_out_of_bounds
non_real_edge
nullptr_error
invalid_atom
invalid_proton
invalid_neutron
invalid_electron
invalid_valence
string_parse_error
unregistered_name
rxn_rate_error
invalid_species
duplicate_variable
missing_information
invalid_type
key_not_found
anchor_alias_dne
initial_error
not_a_token
read_error
invalid_console_input

7.5.3 Function Documentation

7.5.3.1 void error (int *flag*)

7.6 /Users/aladshaw3/projects/ecosystem/include/finch.h File Reference

```
#include "macaw.h"
#include "lark.h"
```

Classes

- struct FINCH_DATA

Macros

- #define FINCH_Picard 0
- #define LARK_Picard 1
- #define LARK_PJFNK 2
- #define Cartesian 0
- #define Cylindrical 1
- #define Spherical 2

Functions

- double max (std::vector< double > &values)
- double min (std::vector< double > &values)
- double minmod (std::vector< double > &values)
- int uTotal (FINCH_DATA *dat)
- int uAverage (FINCH_DATA *dat)
- int check_Mass (FINCH_DATA *dat)
- int l_direct (FINCH_DATA *dat)
- int lark_picard_step (const Matrix< double > &x, Matrix< double > &G, const void *data)
- int nl_picard (FINCH_DATA *dat)
- int setup_FINCH_DATA (int(*user_callroutine)(const void *user_data), int(*user_setic)(const void *user_data), int(*user_timestep)(const void *user_data), int(*user_preprocess)(const void *user_data), int(*user_solve)(const void *user_data), int(*user_setparams)(const void *user_data), int(*user_discretize)(const void *user_data), int(*user_bcs)(const void *user_data), int(*user_res)(const Matrix< double > &x, Matrix< double > &res, const void *user_data), int(*user_precon)(const Matrix< double > &b, Matrix< double > &p, const void *user_data), int(*user_postprocess)(const void *user_data), int(*user_reset)(const void *user_data), FINCH_DATA *dat, const void *param_data)
- void print2file_dim_header (FILE *Output, FINCH_DATA *dat)
- void print2file_time_header (FILE *Output, FINCH_DATA *dat)
- void print2file_result_old (FILE *Output, FINCH_DATA *dat)
- void print2file_result_new (FILE *Output, FINCH_DATA *dat)
- void print2file_newline (FILE *Output, FINCH_DATA *dat)
- void print2file_tab (FILE *Output, FINCH_DATA *dat)
- int default_execution (const void *user_data)
- int default_ic (const void *user_data)
- int default_timestep (const void *user_data)
- int default_preprocess (const void *user_data)
- int default_solve (const void *user_data)
- int default_params (const void *user_data)

- int minmod_discretization (const void *user_data)
- int vanAlbada_discretization (const void *user_data)
- int ospre_discretization (const void *user_data)
- int default_bcs (const void *user_data)
- int default_res (const Matrix< double > &x, Matrix< double > &res, const void *user_data)
- int default_precon (const Matrix< double > &b, Matrix< double > &p, const void *user_data)
- int default_postprocess (const void *user_data)
- int default_reset (const void *user_data)
- int buckley_leverett_ic (const void *user_data)
- int buckley_leverett_params (const void *user_data)
- int burgers_ic (const void *user_data)
- int burgers_params (const void *user_data)
- int burgers_bcs (const void *user_data)
- int FINCH_TESTS ()

7.6.1 Macro Definition Documentation

7.6.1.1 #define Cartesian 0

7.6.1.2 #define Cylindrical 1

7.6.1.3 #define FINCH_Picard 0

7.6.1.4 #define LARK_Picard 1

7.6.1.5 #define LARK_PJFNK 2

7.6.1.6 #define Spherical 2

7.6.2 Function Documentation

7.6.2.1 int buckley_leverett_ic (const void * *user_data*)

7.6.2.2 int buckley_leverett_params (const void * *user_data*)

7.6.2.3 int burgers_bcs (const void * *user_data*)

7.6.2.4 int burgers_ic (const void * *user_data*)

7.6.2.5 int burgers_params (const void * *user_data*)

7.6.2.6 int check_Mass (**FINCH_DATA** * *dat*)

7.6.2.7 int default_bcs (const void * *user_data*)

7.6.2.8 int default_execution (const void * *user_data*)

7.6.2.9 int default_ic (const void * *user_data*)

7.6.2.10 int default_params (const void * *user_data*)

7.6.2.11 int default_postprocess (const void * *user_data*)

7.6.2.12 int default_precon (const **Matrix**< double > & *b,* **Matrix**< double > & *p,* const void * *user_data*)

7.6.2.13 int default_preprocess (const void * *user_data*)

7.6.2.14 int default_res (const Matrix< double > & *x,* Matrix< double > & *res,* const void * *user_data*)

7.6.2.15 int default_reset (const void * *user_data*)

7.6.2.16 int default_solve (const void * *user_data*)

7.6.2.17 int default_timestep (const void * *user_data*)

7.6.2.18 int FINCH_TESTS ( )

7.6.2.19 int l_direct (FINCH_DATA * *dat*)

7.6.2.20 int lark_picard_step (const Matrix< double > & *x,* Matrix< double > & *G,* const void * *data*)

7.6.2.21 double max (std::vector< double > & *values*)

7.6.2.22 double min (std::vector< double > & *values*)

7.6.2.23 double minmod (std::vector< double > & *values*)

7.6.2.24 int minmod_discretization (const void * *user_data*)

7.6.2.25 int nl_picard (FINCH_DATA * *dat*)

7.6.2.26 int ospre_discretization (const void * *user_data*)

7.6.2.27 void print2file_dim_header (FILE * *Output,* FINCH_DATA * *dat*)

7.6.2.28 void print2file_newline (FILE * *Output,* FINCH_DATA * *dat*)

7.6.2.29 void print2file_result_new (FILE * *Output,* FINCH_DATA * *dat*)

7.6.2.30 void print2file_result_old (FILE * *Output,* FINCH_DATA * *dat*)

7.6.2.31 void print2file_tab (FILE * *Output,* FINCH_DATA * *dat*)

7.6.2.32 void print2file_time_header (FILE * *Output,* FINCH_DATA * *dat*)

7.6.2.33 int setup_FINCH_DATA (int(*)(const void *user_data) *user_callroutine,* int(*)(const void *user_data) *user_setic,* int(*)(const void *user_data) *user_timestep,* int(*)(const void *user_data) *user_preprocess,* int(*)(const void *user_data) *user_solve,* int(*)(const void *user_data) *user_setparams,* int(*)(const void *user_data) *user_discretize,* int(*)(const void *user_data) *user_bcs,* int(*)(const Matrix< double > &x, Matrix< double > &res, const void *user_data) *user_res,* int(*)(const Matrix< double > &b, Matrix< double > &p, const void *user_data) *user_precon,* int(*)(const void *user_data) *user_postprocess,* int(*)(const void *user_data) *user_reset,* FINCH_DATA * *dat,* const void * *param_data*)

7.6.2.34 int uAverage (FINCH_DATA * *dat*)

7.6.2.35 int uTotal (FINCH_DATA * *dat*)

7.6.2.36 int vanAlbada_discretization (const void * *user_data*)

7.7 /Users/aladshaw3/projects/ecosystem/include/flock.h File Reference

```
#include "macaw.h"
#include "egret.h"
#include "finch.h"
#include "lark.h"
#include "skua.h"
#include "scopsowl.h"
#include "gsta_opt.h"
#include "magpie.h"
#include "skua_opt.h"
#include "scopsowl_opt.h"
#include "yaml_wrapper.h"
```

7.8 /Users/aladshaw3/projects/ecosystem/include/gsta_opt.h File Reference

```
#include "lmcurve.h"
#include <stdio.h>
#include <math.h>
#include <iostream>
#include <fstream>
#include <stdlib.h>
#include <vector>
#include <time.h>
#include <float.h>
#include <string>
#include "error.h"
```

Classes

- struct GSTA_OPT_DATA

Macros

- #define Po 100.0
- #define R 8.3144621
- #define Na 6.0221413E+23

Functions

- void error ()
- int roundIt (double d)
- int twoFifths (int m)
- int orderMag (double x)
- int minValue (std::vector< int > array)
- int minIndex (std::vector< double > array)
- int avgPar (std::vector< int > array)
- double avgValue (std::vector< double > array)
- double weightedAvg (double *enorm, double *x, int n)
- double rSq (double *x, double *y, double slope, double vint, int m_dat)
- bool isSmooth (double *par, void *data)

- void orthoLinReg (double *x, double *y, double *par, int m_dat, int n_par)
- void eduGuess (double *P, double *q, double *par, int k, int m_dat, void *data)
- double gstaFunc (double p, const double *K, double qmax, int n_par)
- double gstaObjFunc (double *t, double *y, double *par, int m_dat, void *data)
- void eval_GSTA (const double *par, int m_dat, const void *data, double *fvec, int *info)
- int gsta_optimize (const char *fileName)

7.8.1 Macro Definition Documentation

7.8.1.1 #define Na 6.0221413E+23

7.8.1.2 #define Po 100.0

7.8.1.3 #define R 8.3144621

7.8.2 Function Documentation

7.8.2.1 int avgPar (std::vector< int > *array*)

7.8.2.2 double avgValue (std::vector< double > *array*)

7.8.2.3 void eduGuess (double * *P*, double * *q*, double * *par*, int *k*, int *m_dat*, void * *data*)

7.8.2.4 void error ( )

7.8.2.5 void eval_GSTA (const double * *par*, int *m_dat*, const void * *data*, double * *fvec*, int * *info*)

7.8.2.6 int gsta_optimize (const char * *fileName*)

7.8.2.7 double gstaFunc (double *p*, const double * *K*, double *qmax*, int *n_par*)

7.8.2.8 double gstaObjFunc (double * *t*, double * *y*, double * *par*, int *m_dat*, void * *data*)

7.8.2.9 bool isSmooth (double * *par*, void * *data*)

7.8.2.10 int minIndex (std::vector< double > *array*)

7.8.2.11 int minValue (std::vector< int > *array*)

7.8.2.12 int orderMag (double *x*)

7.8.2.13 void orthoLinReg (double * *x*, double * *y*, double * *par*, int *m_dat*, int *n_par*)

7.8.2.14 int roundIt (double *d*)

7.8.2.15 double rSq (double * *x*, double * *y*, double *slope*, double *vint*, int *m_dat*)

7.8.2.16 int twoFifths (int *m*)

7.8.2.17 double weightedAvg (double * *enorm*, double * *x*, int *n*)

7.9 /Users/aladshaw3/projects/ecosystem/include/lark.h File Reference

```
#include "macaw.h"
#include <float.h>
```

Classes

- struct ARNOLDI_DATA
- struct GMRESLP_DATA
- struct GMRESRP_DATA
- struct PCG_DATA
- struct BiCGSTAB_DATA
- struct CGS_DATA
- struct OPTRANS_DATA
- struct GCR_DATA
- struct GMRESR_DATA
- struct PICARD_DATA
- struct BACKTRACK_DATA
- struct PJFNK_DATA
- struct NUM_JAC_DATA
- struct EX01_DATA
- struct EX02_DATA
- struct EX04_DATA
- struct EX09_DATA
- struct EX15_DATA

Enumerations

- enum krylov_method {
  GMRESLP, PCG, BiCGSTAB, CGS,
  FOM, GMRESRP, GCR, GMRESR }

Functions

- int matvec_ex01 (const Matrix< double > &v, Matrix< double > &w, const void *data)
- int precon_ex01 (const Matrix< double > &b, Matrix< double > &p, const void *data)
- int matvec_ex02 (const Matrix< double > &v, Matrix< double > &w, const void *data)
- int matvec_ex04 (const Matrix< double > &v, Matrix< double > &w, const void *data)
- int precon_ex04 (const Matrix< double > &b, Matrix< double > &p, const void *data)
- int evalx_ex09 (const Matrix< double > &x, Matrix< double > &G, const void *data)
- int funeval_ex09 (const Matrix< double > &x, Matrix< double > &F, const void *data)
- int funeval_ex10 (const Matrix< double > &x, Matrix< double > &F, const void *data)
- int precon_ex10 (const Matrix< double > &r, Matrix< double > &p, const void *data)
- int matvec_ex15 (const Matrix< double > &v, Matrix< double > &w, const void *data)
- int precon_ex15 (const Matrix< double > &w, Matrix< double > &p, const void *data)
- int update_arnoldi_solution (Matrix< double > &x, Matrix< double > &x0, ARNOLDI_DATA *arnoldi_dat)
- int arnoldi (int(*matvec)(const Matrix< double > &v, Matrix< double > &w, const void *data), int(*precon)(const Matrix< double > &b, Matrix< double > &p, const void *data), Matrix< double > &r0, ARNOLDI_DATA *arnoldi_dat, const void *matvec_data, const void *precon_data)
- int gmresLeftPreconditioned (int(*matvec)(const Matrix< double > &v, Matrix< double > &w, const void *data), int(*precon)(const Matrix< double > &b, Matrix< double > &p, const void *data), Matrix< double > &b, GMRESLP_DATA *gmreslp_dat, const void *matvec_data, const void *precon_data)
- int fom (int(*matvec)(const Matrix< double > &v, Matrix< double > &w, const void *data), int(*precon)(const Matrix< double > &b, Matrix< double > &p, const void *data), Matrix< double > &b, GMRESLP_DATA *gmreslp_dat, const void *matvec_data, const void *precon_data)

- int gmresRightPreconditioned (int(*matvec)(const Matrix< double > &v, Matrix< double > &w, const void *data), int(*precon)(const Matrix< double > &b, Matrix< double > &p, const void *data), Matrix< double > &b, GMRESRP_DATA *gmresrp_dat, const void *matvec_data, const void *precon_data)
- int pcg (int(*matvec)(const Matrix< double > &p, Matrix< double > &Ap, const void *data), int(*precon)(const Matrix< double > &r, Matrix< double > &z, const void *data), Matrix< double > &b, PCG_DATA *pcg_dat, const void *matvec_data, const void *precon_data)
- int bicgstab (int(*matvec)(const Matrix< double > &p, Matrix< double > &Ap, const void *data), int(*precon)(const Matrix< double > &r, Matrix< double > &z, const void *data), Matrix< double > &b, BiCGSTAB_DATA *bicg_dat, const void *matvec_data, const void *precon_data)
- int cgs (int(*matvec)(const Matrix< double > &p, Matrix< double > &Ap, const void *data), int(*precon)(const Matrix< double > &r, Matrix< double > &z, const void *data), Matrix< double > &b, CGS_DATA *cgs_dat, const void *matvec_data, const void *precon_data)
- int operatorTranspose (int(*matvec)(const Matrix< double > &v, Matrix< double > &Av, const void *data), Matrix< double > &r, Matrix< double > &u, OPTRANS_DATA *transpose_dat, const void *matvec_data)
- int gcr (int(*matvec)(const Matrix< double > &x, Matrix< double > &Ax, const void *data), int(*precon)(const Matrix< double > &r, Matrix< double > &Mr, const void *data), Matrix< double > &b, GCR_DATA *gcr_dat, const void *matvec_data, const void *precon_data)
- int gmresPreconditioner (const Matrix< double > &r, Matrix< double > &Mr, const void *data)
- int gmresr (int(*matvec)(const Matrix< double > &x, Matrix< double > &Ax, const void *data), int(*terminal_precon)(const Matrix< double > &r, Matrix< double > &Mr, const void *data), Matrix< double > &b, GMRESR_DATA *gmresr_dat, const void *matvec_data, const void *term_precon_data)
- int picard (int(*res)(const Matrix< double > &x, Matrix< double > &r, const void *data), int(*evalx)(const Matrix< double > &x0, Matrix< double > &x, const void *data), Matrix< double > &x, PICARD_DATA *picard_dat, const void *res_data, const void *evalx_data)
- int jacvec (const Matrix< double > &v, Matrix< double > &Jv, const void *data)
- int backtrackLineSearch (int(*feval)(const Matrix< double > &x, Matrix< double > &F, const void *data), Matrix< double > &Fkp1, Matrix< double > &xkp1, Matrix< double > &pk, double normFk, BACKTRACK_DATA *backtrack_dat, const void *feval_data)
- int pjfnk (int(*res)(const Matrix< double > &x, Matrix< double > &F, const void *data), int(*precon)(const Matrix< double > &r, Matrix< double > &p, const void *data), Matrix< double > &x, PJFNK_DATA *pjfnk_dat, const void *res_data, const void *precon_data)
- int NumericalJacobian (int(*Func)(const Matrix< double > &x, Matrix< double > &F, const void *user_data), const Matrix< double > &x, Matrix< double > &J, int Nx, int Nf, NUM_JAC_DATA *jac_dat, const void *user_data)
- int LARK_TESTS ()

7.9.1 Enumeration Type Documentation

7.9.1.1 enum krylov_method

Enumerator

GMRESLP

PCG

BiCGSTAB

CGS

FOM

GMRESRP

GCR

GMRESR

7.9.2 Function Documentation

7.9.2.1 int arnoldi (int(∗)(const Matrix< double > &v, Matrix< double > &w, const void ∗data) *matvec,* int(∗)(const Matrix< double > &b, Matrix< double > &p, const void ∗data) *precon,* Matrix< double > & *r0,* ARNOLDI_DATA ∗ *arnoldi_dat,* const void ∗ *matvec_data,* const void ∗ *precon_data*)

7.9.2.2 int backtrackLineSearch (int(∗)(const Matrix< double > &x, Matrix< double > &F, const void ∗data) *feval,* Matrix< double > & *Fkp1,* Matrix< double > & *xkp1,* Matrix< double > & *pk,* double *normFk,* BACKTRACK_DATA ∗ *backtrack_dat,* const void ∗ *feval_data*)

7.9.2.3 int bicgstab (int(∗)(const Matrix< double > &p, Matrix< double > &Ap, const void ∗data) *matvec,* int(∗)(const Matrix< double > &r, Matrix< double > &z, const void ∗data) *precon,* Matrix< double > & *b,* BiCGSTAB_DATA ∗ *bicg_dat,* const void ∗ *matvec_data,* const void ∗ *precon_data*)

7.9.2.4 int cgs (int(∗)(const Matrix< double > &p, Matrix< double > &Ap, const void ∗data) *matvec,* int(∗)(const Matrix< double > &r, Matrix< double > &z, const void ∗data) *precon,* Matrix< double > & *b,* CGS_DATA ∗ *cgs_dat,* const void ∗ *matvec_data,* const void ∗ *precon_data*)

7.9.2.5 int evalx_ex09 (const Matrix< double > & *x,* Matrix< double > & *G,* const void ∗ *data*)

7.9.2.6 int fom (int(∗)(const Matrix< double > &v, Matrix< double > &w, const void ∗data) *matvec,* int(∗)(const Matrix< double > &b, Matrix< double > &p, const void ∗data) *precon,* Matrix< double > & *b,* GMRESLP_DATA ∗ *gmreslp_dat,* const void ∗ *matvec_data,* const void ∗ *precon_data*)

7.9.2.7 int funeval_ex09 (const Matrix< double > & *x,* Matrix< double > & *F,* const void ∗ *data*)

7.9.2.8 int funeval_ex10 (const Matrix< double > & *x,* Matrix< double > & *F,* const void ∗ *data*)

7.9.2.9 int gcr (int(∗)(const Matrix< double > &x, Matrix< double > &Ax, const void ∗data) *matvec,* int(∗)(const Matrix< double > &r, Matrix< double > &Mr, const void ∗data) *precon,* Matrix< double > & *b,* GCR_DATA ∗ *gcr_dat,* const void ∗ *matvec_data,* const void ∗ *precon_data*)

7.9.2.10 int gmresLeftPreconditioned (int(∗)(const Matrix< double > &v, Matrix< double > &w, const void ∗data) *matvec,* int(∗)(const Matrix< double > &b, Matrix< double > &p, const void ∗data) *precon,* Matrix< double > & *b,* GMRESLP_DATA ∗ *gmreslp_dat,* const void ∗ *matvec_data,* const void ∗ *precon_data*)

7.9.2.11 int gmresPreconditioner (const Matrix< double > & *r,* Matrix< double > & *Mr,* const void ∗ *data*)

7.9.2.12 int gmresr (int(∗)(const Matrix< double > &x, Matrix< double > &Ax, const void ∗data) *matvec,* int(∗)(const Matrix< double > &r, Matrix< double > &Mr, const void ∗data) *terminal_precon,* Matrix< double > & *b,* GMRESR_DATA ∗ *gmresr_dat,* const void ∗ *matvec_data,* const void ∗ *term_precon_data*)

7.9.2.13 int gmresRightPreconditioned (int(∗)(const Matrix< double > &v, Matrix< double > &w, const void ∗data) *matvec,* int(∗)(const Matrix< double > &b, Matrix< double > &p, const void ∗data) *precon,* Matrix< double > & *b,* GMRESRP_DATA ∗ *gmresrp_dat,* const void ∗ *matvec_data,* const void ∗ *precon_data*)

7.9.2.14 int jacvec (const Matrix< double > & *v,* Matrix< double > & *Jv,* const void ∗ *data*)

7.9.2.15 int LARK_TESTS ( )

7.9.2.16 int matvec_ex01 (const Matrix< double > & *v,* Matrix< double > & *w,* const void ∗ *data*)

7.9.2.17 int matvec_ex02 (const Matrix< double > & *v,* Matrix< double > & *w,* const void ∗ *data*)

7.9.2.18 int matvec_ex04 (const Matrix< double > & *v,* Matrix< double > & *w,* const void ∗ *data*)

7.9.2.19 int matvec_ex15 (const Matrix< double > & *v,* Matrix< double > & *w,* const void * *data*)

7.9.2.20 int NumericalJacobian (int(*)(const Matrix< double > &x, Matrix< double > &F, const void *user_data) *Func,* const Matrix< double > & *x,* Matrix< double > & *J,* int *Nx,* int *Nf,* NUM_JAC_DATA * *jac_dat,* const void * *user_data*)

7.9.2.21 int operatorTranspose (int(*)(const Matrix< double > &v, Matrix< double > &Av, const void *data) *matvec,* Matrix< double > & *r,* Matrix< double > & *u,* OPTRANS_DATA * *transpose_dat,* const void * *matvec_data*)

7.9.2.22 int pcg (int(*)(const Matrix< double > &p, Matrix< double > &Ap, const void *data) *matvec,* int(*)(const Matrix< double > &r, Matrix< double > &z, const void *data) *precon,* Matrix< double > & *b,* PCG_DATA * *pcg_dat,* const void * *matvec_data,* const void * *precon_data*)

7.9.2.23 int picard (int(*)(const Matrix< double > &x, Matrix< double > &r, const void *data) *res,* int(*)(const Matrix< double > &x0, Matrix< double > &x, const void *data) *evalx,* Matrix< double > & *x,* PICARD_DATA * *picard_dat,* const void * *res_data,* const void * *evalx_data*)

7.9.2.24 int pjfnk (int(*)(const Matrix< double > &x, Matrix< double > &F, const void *data) *res,* int(*)(const Matrix< double > &r, Matrix< double > &p, const void *data) *precon,* Matrix< double > & *x,* PJFNK_DATA * *pjfnk_dat,* const void * *res_data,* const void * *precon_data*)

7.9.2.25 int precon_ex01 (const Matrix< double > & *b,* Matrix< double > & *p,* const void * *data*)

7.9.2.26 int precon_ex04 (const Matrix< double > & *b,* Matrix< double > & *p,* const void * *data*)

7.9.2.27 int precon_ex10 (const Matrix< double > & *r,* Matrix< double > & *p,* const void * *data*)

7.9.2.28 int precon_ex15 (const Matrix< double > & *w,* Matrix< double > & *p,* const void * *data*)

7.9.2.29 int update_arnoldi_solution (Matrix< double > & *x,* Matrix< double > & *x0,* ARNOLDI_DATA * *arnoldi_dat*)

7.10 /Users/aladshaw3/projects/ecosystem/include/lmcurve.h File Reference

```
#include "lmmin.h"
```

Functions

- void lmcurve_fit (int n_par, double *par, int m_dat, const double *t, const double *y, double(*f)(double t, const double *par), const lm_control_struct *control, lm_status_struct *status)

7.10.1 Function Documentation

7.10.1.1 void lmcurve_fit (int *n_par,* double * *par,* int *m_dat,* const double * *t,* const double * *y,* double(*)(double t, const double *par) *f,* const lm_control_struct * *control,* lm_status_struct * *status*)

7.11 /Users/aladshaw3/projects/ecosystem/include/lmmin.h File Reference

Classes

- struct lm_control_struct
- struct lm_status_struct

Functions

- void lm_printout_std (int n_par, const double *par, int m_dat, const void *data, const double *fvec, int printflags, int iflag, int iter, int nfev)
- double lm_enorm (int, const double *)
- void lmmin (int n_par, double *par, int m_dat, const void *data, void(*evaluate)(const double *par, int m_dat, const void *data, double *fvec, int *info), const lm_control_struct *control, lm_status_struct *status, void(*printout)(int n_par, const double *par, int m_dat, const void *data, const double *fvec, int printflags, int iflag, int iter, int nfev))
- void lm_lmdif (int m, int n, double *x, double *fvec, double ftol, double xtol, double gtol, int maxfev, double epsfcn, double *diag, int mode, double factor, int *info, int *nfev, double *fjac, int *ipvt, double *qtf, double *wa1, double *wa2, double *wa3, double *wa4, void(*evaluate)(const double *par, int m_dat, const void *data, double *fvec, int *info), void(*printout)(int n_par, const double *par, int m_dat, const void *data, const double *fvec, int printflags, int iflag, int iter, int nfev), int printflags, const void *data)

Variables

- const lm_control_struct lm_control_double
- const lm_control_struct lm_control_float
- const char * lm_infmsg []
- const char * lm_shortmsg []

7.11.1 Function Documentation

7.11.1.1 double lm_enorm (int , const double *)

sum squares.

calculation of norm.

7.11.1.2 void lm_lmdif (int *m*, int *n*, double * *x*, double * *fvec*, double *ftol*, double *xtol*, double *gtol*, int *maxfev*, double *epsfcn*, double * *diag*, int *mode*, double *factor*, int * *info*, int * *nfev*, double * *fjac*, int * *ipvt*, double * *qtf*, double * *wa1*, double * *wa2*, double * *wa3*, double * *wa4*, void(*)(const double *par, int m_dat, const void *data, double *fvec, int *info) *evaluate*, void(*)(int n_par, const double *par, int m_dat, const void *data, const double *fvec, int printflags, int iflag, int iter, int nfev) *printout*, int *printflags*, const void * *data*)

Legacy low-level interface.

7.11.1.3 void lm_printout_std (int *n_par*, const double * *par*, int *m_dat*, const void * *data*, const double * *fvec*, int *printflags*, int *iflag*, int *iter*, int *nfev*)

7.11.1.4 void lmmin (int *n_par*, double * *par*, int *m_dat*, const void * *data*, void(*)(const double *par, int m_dat, const void *data, double *fvec, int *info) *evaluate*, const lm_control_struct * *control*, lm_status_struct * *status*, void(*)(int n_par, const double *par, int m_dat, const void *data, const double *fvec, int printflags, int iflag, int iter, int nfev) *printout*)

7.11.2 Variable Documentation

7.11.2.1 const lm_control_struct lm_control_double

7.11.2.2 const lm_control_struct lm_control_float

7.11.2.3 const char* lm_infmsg[]

7.11.2.4 const char* lm_shortmsg[ ]

7.12 /Users/aladshaw3/projects/ecosystem/include/macaw.h File Reference

```
#include <stdio.h>
#include <math.h>
#include <iostream>
#include <fstream>
#include <stdlib.h>
#include <vector>
#include <time.h>
#include <float.h>
#include <string>
#include <exception>
#include "error.h"
```

Classes

- class Matrix< T >

Macros

- #define M_PI 3.14159265358979323846264338327950288 /* pi */

Functions

- int MACAW_TESTS ()

7.12.1 Macro Definition Documentation

7.12.1.1 #define M_PI 3.14159265358979323846264338327950288 /* pi */

7.12.2 Function Documentation

7.12.2.1 int MACAW_TESTS ( )

7.13 /Users/aladshaw3/projects/ecosystem/include/magpie.h File Reference

```
#include "lmcurve.h"
#include <stdio.h>
#include <math.h>
#include <iostream>
#include <fstream>
#include <stdlib.h>
#include <vector>
#include <time.h>
#include <float.h>
#include <string>
#include "error.h"
```

Classes

- struct GSTA_DATA
- struct mSPD_DATA
- struct GPAST_DATA
- struct SYSTEM_DATA
- struct MAGPIE_DATA

Macros

- #define DBL_EPSILON 2.2204460492503131e-016
- #define Z 10.0
- #define A 3.13E+09
- #define V 18.92
- #define Po 100.0
- #define R 8.3144621
- #define Na 6.0221413E+23
- #define kB 1.3806488E-23
- #define shapeFactor(v_i) (((Z - 2) ∗ v_i) / (Z ∗ V)) + (2 / Z)
- #define lnKo(H, S, T) -(H / (R ∗ T)) + (S / R)
- #define He(qm, K1, m) (qm ∗ K1) / (m ∗ Po)

Functions

- double qo (double po, const void ∗data, int i)
- double dq_dp (double p, const void ∗data, int i)
- double q_p (double p, const void ∗data, int i)
- double PI (double po, const void ∗data, int i)
- double Qst (double po, const void ∗data, int i)
- double eMax (const void ∗data, int i)
- double lnact_mSPD (const double ∗par, const void ∗data, int i, volatile double PI)
- double grad_mSPD (const double ∗par, const void ∗data, int i)
- double qT (const double ∗par, const void ∗data)
- void initialGuess_mSPD (double ∗par, const void ∗data)
- void eval_po_PI (const double ∗par, int m_dat, const void ∗data, double ∗fvec, int ∗info)
- void eval_po_qo (const double ∗par, int m_dat, const void ∗data, double ∗fvec, int ∗info)
- void eval_po (const double ∗par, int m_dat, const void ∗data, double ∗fvec, int ∗info)
- void eval_eta (const double ∗par, int m_dat, const void ∗data, double ∗fvec, int ∗info)
- void eval_GPAST (const double ∗par, int m_dat, const void ∗data, double ∗fvec, int ∗info)
- int MAGPIE (const void ∗data)
- int MAGPIE_SCENARIOS (const char ∗inputFileName, const char ∗sceneFileName)

7.13.1 Macro Definition Documentation

7.13.1.1 #define A 3.13E+09

7.13.1.2 #define DBL_EPSILON 2.2204460492503131e-016

7.13.1.3 #define He(*qm, K1, m*) (qm ∗ K1) / (m ∗ Po)

7.13.1.4 #define kB 1.3806488E-23

7.13.1.5 #define lnKo(*H, S, T*) -(H / (R ∗ T)) + (S / R)

7.13.1.6 #define Na 6.0221413E+23

7.13.1.7 #define Po 100.0

7.13.1.8 #define R 8.3144621

7.13.1.9 #define shapeFactor(*v_i*) (((Z - 2) * v_i) / (Z * V)) + (2 / Z)

7.13.1.10 #define V 18.92

7.13.1.11 #define Z 10.0

7.13.2 Function Documentation

7.13.2.1 double dq_dp (double *p,* const void * *data,* int *i*)

7.13.2.2 double eMax (const void * *data,* int *i*)

7.13.2.3 void eval_eta (const double * *par,* int *m_dat,* const void * *data,* double * *fvec,* int * *info*)

7.13.2.4 void eval_GPAST (const double * *par,* int *m_dat,* const void * *data,* double * *fvec,* int * *info*)

7.13.2.5 void eval_po (const double * *par,* int *m_dat,* const void * *data,* double * *fvec,* int * *info*)

7.13.2.6 void eval_po_PI (const double * *par,* int *m_dat,* const void * *data,* double * *fvec,* int * *info*)

7.13.2.7 void eval_po_qo (const double * *par,* int *m_dat,* const void * *data,* double * *fvec,* int * *info*)

7.13.2.8 double grad_mSPD (const double * *par,* const void * *data,* int *i*)

7.13.2.9 void initialGuess_mSPD (double * *par,* const void * *data*)

7.13.2.10 double Inact_mSPD (const double * *par,* const void * *data,* int *i,* volatile double *PI*)

7.13.2.11 int MAGPIE (const void * *data*)

7.13.2.12 int MAGPIE_SCENARIOS (const char * *inputFileName,* const char * *sceneFileName*)

7.13.2.13 double PI (double *po,* const void * *data,* int *i*)

7.13.2.14 double q_p (double *p,* const void * *data,* int *i*)

7.13.2.15 double qo (double *po,* const void * *data,* int *i*)

7.13.2.16 double Qst (double *po,* const void * *data,* int *i*)

7.13.2.17 double qT (const double * *par,* const void * *data*)

7.14 /Users/aladshaw3/projects/ecosystem/include/mola.h File Reference

```
#include <ctype.h>
#include "eel.h"
```

Classes

- class Molecule

Functions

- int MOLA_TESTS ()

7.14.1 Function Documentation

7.14.1.1 int MOLA_TESTS ( )

7.15 /Users/aladshaw3/projects/ecosystem/include/monkfish.h File Reference

```
#include "dogfish.h"
```

Classes

- struct MONKFISH_PARAM
- struct MONKFISH_DATA

Functions

- double default_porosity (int i, int l, const void *user_data)
- double default_density (int i, int l, const void *user_data)
- double default_interparticle_diffusion (int i, int l, const void *user_data)
- double default_monk_adsorption (int i, int l, const void *user_data)
- double default_monk_equilibrium (int i, int l, const void *user_data)
- double default_monkfish_retardation (int i, int l, const void *user_data)
- double default_exterior_concentration (int i, const void *user_data)
- double default_film_transfer (int i, const void *user_data)
- int setup_MONKFISH_DATA (FILE *file, double(*eval_porosity)(int i, int l, const void *user_data), double(*eval_density)(int i, int l, const void *user_data), double(*eval_ext_diff)(int i, int l, const void *user_data), double(*eval_adsorb)(int i, int l, const void *user_data), double(*eval_retard)(int i, int l, const void *user_data), double(*eval_ext_conc)(int i, const void *user_data), double(*eval_ext_film)(int i, const void *user_data), double(*dog_diffusion)(int i, int l, const void *user_data), double(*dog_ext_film)(int i, const void *user_data), double(*dog_surf_conc)(int i, const void *user_data), const void *user_data, MONKFISH_DATA *monk_dat)
- int MONKFISH_TESTS ()

7.15.1 Function Documentation

7.15.1.1 double default_density (int *i,* int *l,* const void * *user_data*)

7.15.1.2 double default_exterior_concentration (int *i,* const void * *user_data*)

7.15.1.3 double default_film_transfer (int *i,* const void * *user_data*)

7.15.1.4 double default_interparticle_diffusion (int *i,* int *l,* const void * *user_data*)

7.15.1.5 double default_monk_adsorption (int *i,* int *l,* const void * *user_data*)

7.15.1.6 double default_monk_equilibrium (int *i,* int *l,* const void * *user_data*)

7.15.1.7 double default_monkfish_retardation (int *i,* int *l,* const void * *user_data*)

7.15.1.8 double default_porosity (int *i,* int *l,* const void * *user_data*)

7.15.1.9 int MONKFISH_TESTS ( )

7.15.1.10 int setup_MONKFISH_DATA (FILE * *file,* double(*)(int i, int l, const void *user_data) *eval_porosity,* double(*)(int i, int l, const void *user_data) *eval_density,* double(*)(int i, int l, const void *user_data) *eval_ext_diff,* double(*)(int i, int l, const void *user_data) *eval_adsorb,* double(*)(int i, int l, const void *user_data) *eval_retard,* double(*)(int i, const void *user_data) *eval_ext_conc,* double(*)(int i, const void *user_data) *eval_ext_film,* double(*)(int i, int l, const void *user_data) *dog_diffusion,* double(*)(int i, const void *user_data) *dog_ext_film,* double(*)(int i, const void *user_data) *dog_surf_conc,* const void * *user_data,* MONKFISH_DATA * *monk_dat*)

7.16 /Users/aladshaw3/projects/ecosystem/include/sandbox.h File Reference

```
#include "flock.h"
#include "school.h"
```

Classes

- struct Speciation_Test01_Data

Functions

- int Speciation_Test01_Function (const Matrix< double > &x, Matrix< double > &F, const void *res_data)
- int Speciation_Test01_Jacobian (const Matrix< double > &x, Matrix< double > &J, const void *precon_data)
- int Speciation_Test01_Guess (const void *user_data)
- int Speciation_Test01_MatVec (const Matrix< double > &x, Matrix< double > &Ax, const void *matvec_data)
- int RUN_SANDBOX ()

7.16.1 Function Documentation

7.16.1.1 int RUN_SANDBOX ( )

7.16.1.2 int Speciation_Test01_Function (const Matrix< double > & *x,* Matrix< double > & *F,* const void * *res_data*)

7.16.1.3 int Speciation_Test01_Guess (const void * *user_data*)

7.16.1.4 int Speciation_Test01_Jacobian (const Matrix< double > & *x,* Matrix< double > & *J,* const void * *precon_data*)

7.16.1.5 int Speciation_Test01_MatVec (const Matrix< double > & *x,* Matrix< double > & *Ax,* const void * *matvec_data*)

7.17 /Users/aladshaw3/projects/ecosystem/include/school.h File Reference

```
#include "eel.h"
#include "mola.h"
#include "shark.h"
#include "dogfish.h"
#include "monkfish.h"
#include "yaml_wrapper.h"
```

7.18 /Users/aladshaw3/projects/ecosystem/include/scopsowl.h File Reference

```
#include "egret.h"
#include "skua.h"
```

Classes

- struct SCOPSOWL_PARAM_DATA
- struct SCOPSOWL_DATA

Macros

- #define SCOPSOWL_HPP_
- #define Dp(Dm, ep) (ep∗ep∗Dm)
- #define Dk(rp, T, MW) (9700.0∗rp∗pow((T/MW),0.5))
- #define avgDp(Dp, Dk) (pow(((1/Dp)+(1/Dk)),-1.0))

Functions

- void print2file_species_header (FILE ∗Output, SCOPSOWL_DATA ∗owl_dat, int i)
- void print2file_SCOPSOWL_time_header (FILE ∗Output, SCOPSOWL_DATA ∗owl_dat, int i)
- void print2file_SCOPSOWL_header (SCOPSOWL_DATA ∗owl_dat)
- void print2file_SCOPSOWL_result_old (SCOPSOWL_DATA ∗owl_dat)
- void print2file_SCOPSOWL_result_new (SCOPSOWL_DATA ∗owl_dat)
- double default_adsorption (int i, int l, const void ∗user_data)
- double default_retardation (int i, int l, const void ∗user_data)
- double default_pore_diffusion (int i, int l, const void ∗user_data)
- double default_surf_diffusion (int i, int l, const void ∗user_data)
- double default_effective_diffusion (int i, int l, const void ∗user_data)
- double const_pore_diffusion (int i, int l, const void ∗user_data)
- double default_filmMassTransfer (int i, const void ∗user_data)
- double const_filmMassTransfer (int i, const void ∗user_data)
- int setup_SCOPSOWL_DATA (FILE ∗file, double(∗eval_sorption)(int i, int l, const void ∗user_data), double(∗eval_retardation)(int i, int l, const void ∗user_data), double(∗eval_pore_diff)(int i, int l, const void ∗user_data), double(∗eval_filmMT)(int i, const void ∗user_data), double(∗eval_surface_diff)(int i, int l, const void ∗user_data), const void ∗user_data, MIXED_GAS ∗gas_data, SCOPSOWL_DATA ∗owl_data)
- int SCOPSOWL_Executioner (SCOPSOWL_DATA ∗owl_dat)
- int set_SCOPSOWL_ICs (SCOPSOWL_DATA ∗owl_dat)
- int set_SCOPSOWL_timestep (SCOPSOWL_DATA ∗owl_dat)
- int SCOPSOWL_preprocesses (SCOPSOWL_DATA ∗owl_dat)
- int set_SCOPSOWL_params (const void ∗user_data)
- int SCOPSOWL_postprocesses (SCOPSOWL_DATA ∗owl_dat)
- int SCOPSOWL_reset (SCOPSOWL_DATA ∗owl_dat)
- int SCOPSOWL (SCOPSOWL_DATA ∗owl_dat)
- int LARGE_CYCLE_TEST01 (SCOPSOWL_DATA ∗owl_dat)
- int SMALL_CYCLE_TEST02 (SCOPSOWL_DATA ∗owl_dat)
- int CURVE_TEST03 (SCOPSOWL_DATA ∗owl_dat)
- int CURVE_TEST04 (SCOPSOWL_DATA ∗owl_dat)
- int CURVE_TEST05 (SCOPSOWL_DATA ∗owl_dat)
- int SCOPSOWL_SCENARIOS (const char ∗scene, const char ∗sorbent, const char ∗comp, const char ∗sorbate)
- int SCOPSOWL_TESTS ()

7.18.1 Macro Definition Documentation

7.18.1.1 #define avgDp(Dp, Dk) (pow(((1/Dp)+(1/Dk)),-1.0))

7.18.1.2 #define Dk(rp, T, MW) (9700.0∗rp∗pow((T/MW),0.5))

7.18.1.3 #define Dp(Dm, ep) (ep∗ep∗Dm)

7.18.1.4 #define SCOPSOWL_HPP_

7.18.2 Function Documentation

7.18.2.1 double const_filmMassTransfer (int *i,* const void ∗ *user_data*)

7.18.2.2 double const_pore_diffusion (int *i,* int *l,* const void ∗ *user_data*)

7.18.2.3 int CURVE_TEST03 (SCOPSOWL_DATA ∗ *owl_dat*)

7.18.2.4 int CURVE_TEST04 (SCOPSOWL_DATA ∗ *owl_dat*)

7.18.2.5 int CURVE_TEST05 (SCOPSOWL_DATA ∗ *owl_dat*)

7.18.2.6 double default_adsorption (int *i,* int *l,* const void ∗ *user_data*)

7.18.2.7 double default_effective_diffusion (int *i,* int *l,* const void ∗ *user_data*)

7.18.2.8 double default_filmMassTransfer (int *i,* const void ∗ *user_data*)

7.18.2.9 double default_pore_diffusion (int *i,* int *l,* const void ∗ *user_data*)

7.18.2.10 double default_retardation (int *i,* int *l,* const void ∗ *user_data*)

7.18.2.11 double default_surf_diffusion (int *i,* int *l,* const void ∗ *user_data*)

7.18.2.12 int LARGE_CYCLE_TEST01 (SCOPSOWL_DATA ∗ *owl_dat*)

7.18.2.13 void print2file_SCOPSOWL_header (SCOPSOWL_DATA ∗ *owl_dat*)

7.18.2.14 void print2file_SCOPSOWL_result_new (SCOPSOWL_DATA ∗ *owl_dat*)

7.18.2.15 void print2file_SCOPSOWL_result_old (SCOPSOWL_DATA ∗ *owl_dat*)

7.18.2.16 void print2file_SCOPSOWL_time_header (FILE ∗ *Output,* SCOPSOWL_DATA ∗ *owl_dat,* int *i*)

7.18.2.17 void print2file_species_header (FILE ∗ *Output,* SCOPSOWL_DATA ∗ *owl_dat,* int *i*)

7.18.2.18 int SCOPSOWL (SCOPSOWL_DATA ∗ *owl_dat*)

7.18.2.19 int SCOPSOWL_Executioner (SCOPSOWL_DATA ∗ *owl_dat*)

7.18.2.20 int SCOPSOWL_postprocesses (SCOPSOWL_DATA ∗ *owl_dat*)

7.18.2.21 int SCOPSOWL_preprocesses (SCOPSOWL_DATA ∗ *owl_dat*)

7.18.2.22 int SCOPSOWL_reset (SCOPSOWL_DATA ∗ *owl_dat*)

7.18.2.23 int SCOPSOWL_SCENARIOS (const char * *scene,* const char * *sorbent,* const char * *comp,* const char * *sorbate*)

7.18.2.24 int SCOPSOWL_TESTS ( )

7.18.2.25 int set_SCOPSOWL_ICs (SCOPSOWL_DATA * *owl_dat*)

7.18.2.26 int set_SCOPSOWL_params (const void * *user_data*)

7.18.2.27 int set_SCOPSOWL_timestep (SCOPSOWL_DATA * *owl_dat*)

7.18.2.28 int setup_SCOPSOWL_DATA (FILE * *file,* double(*)(int i, int l, const void *user_data) *eval_sorption,* double(*)(int i, int l, const void *user_data) *eval_retardation,* double(*)(int i, int l, const void *user_data) *eval_pore_diff,* double(*)(int i, const void *user_data) *eval_filmMT,* double(*)(int i, int l, const void *user_data) *eval_surface_diff,* const void * *user_data,* MIXED_GAS * *gas_data,* SCOPSOWL_DATA * *owl_data*)

7.18.2.29 int SMALL_CYCLE_TEST02 (SCOPSOWL_DATA * *owl_dat*)

7.19 /Users/aladshaw3/projects/ecosystem/include/scopsowl_opt.h File Reference

```
#include "scopsowl.h"
```

Classes

- struct SCOPSOWL_OPT_DATA

Functions

- int SCOPSOWL_OPT_set_y (SCOPSOWL_OPT_DATA *owl_opt)
- int initial_guess_SCOPSOWL (SCOPSOWL_OPT_DATA *owl_opt)
- void eval_SCOPSOWL_Uptake (const double *par, int m_dat, const void *data, double *fvec, int *info)
- int SCOPSOWL_OPTIMIZE (const char *scene, const char *sorbent, const char *comp, const char *sorbate, const char *data)

7.19.1 Function Documentation

7.19.1.1 void eval_SCOPSOWL_Uptake (const double * *par,* int *m_dat,* const void * *data,* double * *fvec,* int * *info*)

7.19.1.2 int initial_guess_SCOPSOWL (SCOPSOWL_OPT_DATA * *owl_opt*)

7.19.1.3 int SCOPSOWL_OPT_set_y (SCOPSOWL_OPT_DATA * *owl_opt*)

7.19.1.4 int SCOPSOWL_OPTIMIZE (const char * *scene,* const char * *sorbent,* const char * *comp,* const char * *sorbate,* const char * *data*)

7.20 /Users/aladshaw3/projects/ecosystem/include/shark.h File Reference

```
#include "mola.h"
#include "macaw.h"
#include "lark.h"
#include "yaml_wrapper.h"
```

Classes

- class MasterSpeciesList
- class Reaction
- class MassBalance
- class UnsteadyReaction
- class Mechanism
- class Precipitation
- class UnsteadyPrecipitation
- struct SHARK_DATA

Macros

- #define Rstd 8.3144621

Typedefs

- typedef struct SHARK_DATA SHARK_DATA

Enumerations

- enum valid_act {
  IDEAL, DAVIES, DEBYE_HUCKEL, DAVIES_LADSHAW,
  SIT, PITZER }

Functions

- void print2file_shark_info (SHARK_DATA *shark_dat)
- void print2file_shark_header (SHARK_DATA *shark_dat)
- void print2file_shark_results_new (SHARK_DATA *shark_dat)
- void print2file_shark_results_old (SHARK_DATA *shark_dat)
- int ideal_solution (const Matrix< double > &x, Matrix< double > &F, const void *data)
- int Davies_equation (const Matrix< double > &x, Matrix< double > &F, const void *data)
- int DebyeHuckel_equation (const Matrix< double > &x, Matrix< double > &F, const void *data)
- int DaviesLadshaw_equation (const Matrix< double > &x, Matrix< double > &F, const void *data)
- int act_choice (const std::string &input)
- bool linesearch_choice (const std::string &input)
- int linearsolve_choice (const std::string &input)
- int Convert2LogConcentration (const Matrix< double > &x, Matrix< double > &logx)
- int Convert2Concentration (const Matrix< double > &logx, Matrix< double > &x)
- int read_scenario (SHARK_DATA *shark_dat)
- int read_options (SHARK_DATA *shark_dat)
- int read_species (SHARK_DATA *shark_dat)
- int read_massbalance (SHARK_DATA *shark_dat)
- int read_equilrxn (SHARK_DATA *shark_dat)
- int read_unsteadyrxn (SHARK_DATA *shark_dat)
- int setup_SHARK_DATA (FILE *file, int(*residual)(const Matrix< double > &x, Matrix< double > &res, const void *data), int(*activity)(const Matrix< double > &x, Matrix< double > &gama, const void *data), int(*precond)(const Matrix< double > &r, Matrix< double > &p, const void *data), SHARK_DATA *dat, const void *activity_data, const void *residual_data, const void *precon_data, const void *other_data)
- int shark_add_customResidual (int i, double(*other_res)(const Matrix< double > &x, SHARK_DATA *shark_dat, const void *other_data), SHARK_DATA *shark_dat)
- int shark_parameter_check (SHARK_DATA *shark_dat)

- int shark_energy_calculations (SHARK_DATA *shark_dat)
- int shark_temperature_calculations (SHARK_DATA *shark_dat)
- int shark_pH_finder (SHARK_DATA *shark_dat)
- int shark_guess (SHARK_DATA *shark_dat)
- int shark_initial_conditions (SHARK_DATA *shark_dat)
- int shark_executioner (SHARK_DATA *shark_dat)
- int shark_timestep_const (SHARK_DATA *shark_dat)
- int shark_timestep_adapt (SHARK_DATA *shark_dat)
- int shark_preprocesses (SHARK_DATA *shark_dat)
- int shark_solver (SHARK_DATA *shark_dat)
- int shark_postprocesses (SHARK_DATA *shark_dat)
- int shark_reset (SHARK_DATA *shark_dat)
- int shark_residual (const Matrix< double > &x, Matrix< double > &F, const void *data)
- int SHARK (SHARK_DATA *shark_dat)
- int SHARK_SCENARIO (const char *yaml_input)
- int SHARK_TESTS ()

7.20.1 Macro Definition Documentation

7.20.1.1 #define Rstd 8.3144621

7.20.2 Typedef Documentation

7.20.2.1 typedef struct SHARK_DATA SHARK_DATA

7.20.3 Enumeration Type Documentation

7.20.3.1 enum valid_act

Enumerator

IDEAL

DAVIES

DEBYE_HUCKEL

DAVIES_LADSHAW

SIT

PITZER

7.20.4 Function Documentation

7.20.4.1 int act_choice (const std::string & *input*)

7.20.4.2 int Convert2Concentration (const **Matrix**< double > & *logx*, **Matrix**< double > & *x*)

7.20.4.3 int Convert2LogConcentration (const **Matrix**< double > & *x*, **Matrix**< double > & *logx*)

7.20.4.4 int Davies_equation (const **Matrix**< double > & *x*, **Matrix**< double > & *F*, const void * *data*)

7.20.4.5 int DaviesLadshaw_equation (const **Matrix**< double > & *x*, **Matrix**< double > & *F*, const void * *data*)

7.20.4.6 int DebyeHuckel_equation (const **Matrix**< double > & *x*, **Matrix**< double > & *F*, const void * *data*)

7.20.4.7 int ideal_solution (const **Matrix**< double > & *x*, **Matrix**< double > & *F*, const void * *data*)

7.20.4.8 int linearsolve_choice (const std::string & *input*)

7.20.4.9 bool linesearch_choice (const std::string & *input*)

7.20.4.10 void print2file_shark_header (SHARK_DATA * *shark_dat*)

7.20.4.11 void print2file_shark_info (SHARK_DATA * *shark_dat*)

7.20.4.12 void print2file_shark_results_new (SHARK_DATA * *shark_dat*)

7.20.4.13 void print2file_shark_results_old (SHARK_DATA * *shark_dat*)

7.20.4.14 int read_equilrxn (SHARK_DATA * *shark_dat*)

7.20.4.15 int read_massbalance (SHARK_DATA * *shark_dat*)

7.20.4.16 int read_options (SHARK_DATA * *shark_dat*)

7.20.4.17 int read_scenario (SHARK_DATA * *shark_dat*)

7.20.4.18 int read_species (SHARK_DATA * *shark_dat*)

7.20.4.19 int read_unsteadyrxn (SHARK_DATA * *shark_dat*)

7.20.4.20 int setup_SHARK_DATA (FILE * *file,* int(*)(const Matrix< double > &x, Matrix< double > &res, const void *data) *residual,* int(*)(const Matrix< double > &x, Matrix< double > &gama, const void *data) *activity,* int(*)(const Matrix< double > &r, Matrix< double > &p, const void *data) *precond,* SHARK_DATA * *dat,* const void * *activity_data,* const void * *residual_data,* const void * *precon_data,* const void * *other_data*)

7.20.4.21 int SHARK (SHARK_DATA * *shark_dat*)

7.20.4.22 int shark_add_customResidual (int *i,* double(*)(const Matrix< double > &x, SHARK_DATA *shark_dat, const void *other_data) *other_res,* SHARK_DATA * *shark_dat*)

7.20.4.23 int shark_energy_calculations (SHARK_DATA * *shark_dat*)

7.20.4.24 int shark_executioner (SHARK_DATA * *shark_dat*)

7.20.4.25 int shark_guess (SHARK_DATA * *shark_dat*)

7.20.4.26 int shark_initial_conditions (SHARK_DATA * *shark_dat*)

7.20.4.27 int shark_parameter_check (SHARK_DATA * *shark_dat*)

7.20.4.28 int shark_pH_finder (SHARK_DATA * *shark_dat*)

7.20.4.29 int shark_postprocesses (SHARK_DATA * *shark_dat*)

7.20.4.30 int shark_preprocesses (SHARK_DATA * *shark_dat*)

7.20.4.31 int shark_reset (SHARK_DATA * *shark_dat*)

7.20.4.32 int shark_residual (const Matrix< double > & *x,* Matrix< double > & *F,* const void * *data*)

7.20.4.33 int SHARK_SCENARIO (const char * *yaml_input*)

7.20.4.34 int shark_solver (SHARK_DATA * *shark_dat*)

7.20.4.35 int shark_temperature_calculations (SHARK_DATA * *shark_dat*)

7.20.4.36 int SHARK_TESTS ( )

7.20.4.37 int shark_timestep_adapt (SHARK_DATA * *shark_dat*)

7.20.4.38 int shark_timestep_const (SHARK_DATA * *shark_dat*)

7.21 /Users/aladshaw3/projects/ecosystem/include/skua.h File Reference

```
#include "finch.h"
#include "magpie.h"
#include "egret.h"
```

Classes

- struct SKUA_PARAM
- struct SKUA_DATA

Macros

- #define SKUA_HPP_
- #define D_inf(Dref, Tref, B, p, T) (Dref * pow(p+sqrt(DBL_EPSILON),(Tref/T)-B))
- #define D_o(Diff, E, T) (Diff * exp(-E/(Rstd*T)))
- #define D_c(Diff, phi) (Diff * (1.0/((1.0+1.1E-6)-phi)))

Functions

- void print2file_species_header (FILE *Output, SKUA_DATA *skua_dat, int i)
- void print2file_SKUA_time_header (FILE *Output, SKUA_DATA *skua_dat, int i)
- void print2file_SKUA_header (SKUA_DATA *skua_dat)
- void print2file_SKUA_results_old (SKUA_DATA *skua_dat)
- void print2file_SKUA_results_new (SKUA_DATA *skua_dat)
- double default_Dc (int i, int l, const void *data)
- double default_kf (int i, const void *data)
- double const_Dc (int i, int l, const void *data)
- double simple_darken_Dc (int i, int l, const void *data)
- double theoretical_darken_Dc (int i, int l, const void *data)
- double empirical_kf (int i, const void *data)
- double const_kf (int i, const void *data)
- int molefractionCheck (SKUA_DATA *skua_dat)
- int setup_SKUA_DATA (FILE *file, double(*eval_Dc)(int i, int l, const void *user_data), double(*eval_Kf)(int i, const void *user_data), const void *user_data, MIXED_GAS *gas_data, SKUA_DATA *skua_dat)
- int SKUA_Executioner (SKUA_DATA *skua_dat)
- int set_SKUA_ICs (SKUA_DATA *skua_dat)
- int set_SKUA_timestep (SKUA_DATA *skua_dat)
- int SKUA_preprocesses (SKUA_DATA *skua_dat)
- int set_SKUA_params (const void *user_data)
- int SKUA_postprocesses (SKUA_DATA *skua_dat)
- int SKUA_reset (SKUA_DATA *skua_dat)

- int SKUA (SKUA_DATA *skua_dat)
- int SKUA_CYCLE_TEST01 (SKUA_DATA *skua_dat)
- int SKUA_CYCLE_TEST02 (SKUA_DATA *skua_dat)
- int SKUA_LOW_TEST03 (SKUA_DATA *skua_dat)
- int SKUA_MID_TEST04 (SKUA_DATA *skua_dat)
- int SKUA_SCENARIOS (const char *scene, const char *sorbent, const char *comp, const char *sorbate)
- int SKUA_TESTS ()

7.21.1 Macro Definition Documentation

7.21.1.1 #define D_c(*Diff, phi*) (Diff * (1.0/((1.0+1.1E-6)-phi)))

7.21.1.2 #define D_inf(*Dref, Tref, B, p, T*) (Dref * pow(p+sqrt(DBL_EPSILON),(Tref/T)-B))

7.21.1.3 #define D_o(*Diff, E, T*) (Diff * exp(-E/(Rstd*T)))

7.21.1.4 #define SKUA_HPP_

7.21.2 Function Documentation

7.21.2.1 double const_Dc (int *i,* int *l,* const void * *data*)

7.21.2.2 double const_kf (int *i,* const void * *data*)

7.21.2.3 double default_Dc (int *i,* int *l,* const void * *data*)

7.21.2.4 double default_kf (int *i,* const void * *data*)

7.21.2.5 double empirical_kf (int *i,* const void * *data*)

7.21.2.6 int molefractionCheck (SKUA_DATA * *skua_dat*)

7.21.2.7 void print2file_SKUA_header (SKUA_DATA * *skua_dat*)

7.21.2.8 void print2file_SKUA_results_new (SKUA_DATA * *skua_dat*)

7.21.2.9 void print2file_SKUA_results_old (SKUA_DATA * *skua_dat*)

7.21.2.10 void print2file_SKUA_time_header (FILE * *Output,* SKUA_DATA * *skua_dat,* int *i*)

7.21.2.11 void print2file_species_header (FILE * *Output,* SKUA_DATA * *skua_dat,* int *i*)

7.21.2.12 int set_SKUA_ICs (SKUA_DATA * *skua_dat*)

7.21.2.13 int set_SKUA_params (const void * *user_data*)

7.21.2.14 int set_SKUA_timestep (SKUA_DATA * *skua_dat*)

7.21.2.15 int setup_SKUA_DATA (FILE * *file,* double(*)(int i, int l, const void *user_data) *eval_Dc,* double(*)(int i, const void *user_data) *eval_Kf,* const void * *user_data,* MIXED_GAS * *gas_data,* SKUA_DATA * *skua_dat*)

7.21.2.16 double simple_darken_Dc (int *i,* int *l,* const void * *data*)

7.21.2.17 int SKUA (SKUA_DATA * *skua_dat*)

7.21.2.18 int SKUA_CYCLE_TEST01 (SKUA_DATA * *skua_dat*)

7.21.2.19 int SKUA_CYCLE_TEST02 (SKUA_DATA * *skua_dat*)

7.21.2.20 int SKUA_Executioner (SKUA_DATA * *skua_dat*)

7.21.2.21 int SKUA_LOW_TEST03 (SKUA_DATA * *skua_dat*)

7.21.2.22 int SKUA_MID_TEST04 (SKUA_DATA * *skua_dat*)

7.21.2.23 int SKUA_postprocesses (SKUA_DATA * *skua_dat*)

7.21.2.24 int SKUA_preprocesses (SKUA_DATA * *skua_dat*)

7.21.2.25 int SKUA_reset (SKUA_DATA * *skua_dat*)

7.21.2.26 int SKUA_SCENARIOS (const char * *scene,* const char * *sorbent,* const char * *comp,* const char * *sorbate*)

7.21.2.27 int SKUA_TESTS ( )

7.21.2.28 double theoretical_darken_Dc (int *i,* int *l,* const void * *data*)

7.22 /Users/aladshaw3/projects/ecosystem/include/skua_opt.h File Reference

```
#include "skua.h"
```

Classes

- struct SKUA_OPT_DATA

Functions

- int SKUA_OPT_set_y (SKUA_OPT_DATA *skua_opt)
- int initial_guess_SKUA (SKUA_OPT_DATA *skua_opt)
- void eval_SKUA_Uptake (const double *par, int m_dat, const void *data, double *fvec, int *info)
- int SKUA_OPTIMIZE (const char *scene, const char *sorbent, const char *comp, const char *sorbate, const char *data)

7.22.1 Function Documentation

7.22.1.1 void eval_SKUA_Uptake (const double * *par,* int *m_dat,* const void * *data,* double * *fvec,* int * *info*)

7.22.1.2 int initial_guess_SKUA (SKUA_OPT_DATA * *skua_opt*)

7.22.1.3 int SKUA_OPT_set_y (SKUA_OPT_DATA * *skua_opt*)

7.22.1.4 int SKUA_OPTIMIZE (const char * *scene,* const char * *sorbent,* const char * *comp,* const char * *sorbate,* const char * *data*)

7.23 /Users/aladshaw3/projects/ecosystem/include/Trajectory.h File Reference

```
#include "macaw.h"
```

```
#include <random>
#include <chrono>
```

Classes

- struct TRAJECTORY_DATA

Functions

- double Magnetic_R (const Matrix< double > &dX, const Matrix< double > &dY, int i, double b, double mu_0, double chi_p, double M, double H0, double a)
- double Magnetic_T (const Matrix< double > &dX, const Matrix< double > &dY, int i, double b, double mu_0, double chi_p, double M, double H0, double a)
- double Grav_R (const Matrix< double > &dX, int i, double b, double rho_p, double rho_f)
- double Grav_T (const Matrix< double > &dX, int i, double b, double rho_p, double rho_f)
- double Van_R (const Matrix< double > &dX, const Matrix< double > &dY, int i, double Hamaker, double b, double a)
- double V_RAD (const Matrix< double > &dX, const Matrix< double > &dY, int i, double V0, double rho_f, double a, double eta)
- double V_THETA (const Matrix< double > &dX, const Matrix< double > &dY, int i, double V0, double rho_f, double a, double eta)
- double Brown_RAD (double n_rand, double m_rand, double sigma_n, double sigma_m)
- double Brown_THETA (double s_rand, double t_rand, double sigma_n, double sigma_m)
- int POLAR (Matrix< double > &POL, const Matrix< double > &dX, const Matrix< double > &dY, const void *data, int i)
- double RADIAL_FORCE (const Matrix< double > &POL, double eta, double b, double mp, double t, double a)
- double TANGENTIAL_FORCE (const Matrix< double > &POL, const Matrix< double > &dY, double eta, double b, double mp, double t, double a, int i)
- int CARTESIAN (const Matrix< double > &POL, Matrix< double > &H, const Matrix< double > &dY, double i, const void *data)
- int DISPLACEMENT (Matrix< double > &dX, Matrix< double > &dY, const Matrix< double > &H, int i)
- int LOCATION (const Matrix< double > &dY, const Matrix< double > &dX, Matrix< double > &X, Matrix< double > &Y, int i)
- double Removal_Efficiency (double Sum_Cap, const void *data)
- int Trajectory_SetupConstants (TRAJECTORY_DATA *dat)
- int Number_Generator (TRAJECTORY_DATA *dat)
- int Run_Trajectory ()

7.23.1 Function Documentation

7.23.1.1 double Brown_RAD (double *n_rand,* double *m_rand,* double *sigma_n,* double *sigma_m*)

7.23.1.2 double Brown_THETA (double *s_rand,* double *t_rand,* double *sigma_n,* double *sigma_m*)

7.23.1.3 int CARTESIAN (const Matrix< double > & *POL,* Matrix< double > & *H,* const Matrix< double > & *dY,* double *i,* const void * *data*)

7.23.1.4 int DISPLACEMENT (Matrix< double > & *dX,* Matrix< double > & *dY,* const Matrix< double > & *H,* int *i*)

7.23.1.5 double Grav_R (const Matrix< double > & *dX,* int *i,* double *b,* double *rho_p,* double *rho_f*)

7.23.1.6 double Grav_T (const Matrix< double > & *dX,* int *i,* double *b,* double *rho_p,* double *rho_f*)

7.23.1.7 int LOCATION (const Matrix< double > & *dY,* const Matrix< double > & *dX,* Matrix< double > & *X,* Matrix< double > & *Y,* int *i*)

7.23.1.8 double Magnetic_R (const Matrix< double > & *dX,* const Matrix< double > & *dY,* int *i,* double *b,* double *mu_0,* double *chi_p,* double *M,* double *H0,* double *a*)

7.23.1.9 double Magnetic_T (const Matrix< double > & *dX,* const Matrix< double > & *dY,* int *i,* double *b,* double *mu_0,* double *chi_p,* double *M,* double *H0,* double *a*)

7.23.1.10 int Number_Generator (TRAJECTORY_DATA * *dat*)

7.23.1.11 int POLAR (Matrix< double > & *POL,* const Matrix< double > & *dX,* const Matrix< double > & *dY,* const void * *data,* int *i*)

7.23.1.12 double RADIAL_FORCE (const Matrix< double > & *POL,* double *eta,* double *b,* double *mp,* double *t,* double *a*)

7.23.1.13 double Removal_Efficiency (double *Sum_Cap,* const void * *data*)

7.23.1.14 int Run_Trajectory ( )

7.23.1.15 double TANGENTIAL_FORCE (const Matrix< double > & *POL,* const Matrix< double > & *dY,* double *eta,* double *b,* double *mp,* double *t,* double *a,* int *i*)

7.23.1.16 int Trajectory_SetupConstants (TRAJECTORY_DATA * *dat*)

7.23.1.17 double V_RAD (const Matrix< double > & *dX,* const Matrix< double > & *dY,* int *i,* double *V0,* double *rho_f,* double *a,* double *eta*)

7.23.1.18 double V_THETA (const Matrix< double > & *dX,* const Matrix< double > & *dY,* int *i,* double *V0,* double *rho_f,* double *a,* double *eta*)

7.23.1.19 double Van_R (const Matrix< double > & *dX,* const Matrix< double > & *dY,* int *i,* double *Hamaker,* double *b,* double *a*)

7.24 /Users/aladshaw3/projects/ecosystem/include/ui.h File Reference

```
#include <fstream>
#include <string>
#include <iostream>
#include "error.h"
#include "yaml_wrapper.h"
#include "flock.h"
#include "school.h"
#include "sandbox.h"
#include "Trajectory.h"
```

Classes

- struct UI_DATA

Macros

- #define UI_HPP_
- #define ECO_VERSION "0.0 alpha"

- #define ECO_EXECUTABLE "eco0"

Enumerations

- enum valid_options {
  TEST, EXECUTE, EXIT, CONTINUE,
  HELP, dogfish, eel, egret,
  finch, lark, macaw, mola,
  monkfish, sandbox, scopsowl, shark,
  skua, gsta_opt, magpie, scops_opt,
  skua_opt, trajectory }

Functions

- void aui_help ()
- void bui_help ()
- std::string allLower (const std::string &input)
- bool exit (const std::string &input)
- bool help (const std::string &input)
- bool version (const std::string &input)
- bool test (const std::string &input)
- bool exec (const std::string &input)
- bool path (const std::string &input)
- bool input (const std::string &input)
- bool valid_test_string (const std::string &input, UI_DATA *ui_dat)
- bool valid_exec_string (const std::string &input, UI_DATA *ui_dat)
- int number_files (UI_DATA *ui_dat)
- bool valid_addon_options (UI_DATA *ui_dat)
- void exec_option (UI_DATA *ui_dat)
- void display_help (UI_DATA *ui_dat)
- void display_version (UI_DATA *ui_dat)
- int invalid_input (int count, int max)
- bool valid_input_main (UI_DATA *ui_dat)
- bool valid_input_tests (UI_DATA *ui_dat)
- bool valid_input_execute (UI_DATA *ui_dat)
- int test_loop (UI_DATA *ui_dat)
- int exec_loop (UI_DATA *ui_dat)
- int run_test (UI_DATA *ui_dat)
- int run_exec (UI_DATA *ui_dat)
- int run_executable (int argc, const char *argv[])

7.24.1 Macro Definition Documentation

7.24.1.1 #define ECO_EXECUTABLE "eco0"

7.24.1.2 #define ECO_VERSION "0.0 alpha"

7.24.1.3 #define UI_HPP_

7.24.2 Enumeration Type Documentation

7.24.2.1 enum valid_options

Enumerator

TEST

EXECUTE

EXIT

CONTINUE

HELP

dogfish

eel

egret

finch

lark

macaw

mola

monkfish

sandbox

scopsowl

shark

skua

gsta_opt

magpie

scops_opt

skua_opt

trajectory

7.24.3 Function Documentation

7.24.3.1 std::string allLower (const std::string & *input*)

7.24.3.2 void aui_help ( )

7.24.3.3 void bui_help ( )

7.24.3.4 void display_help (**UI_DATA** * *ui_dat*)

7.24.3.5 void display_version (**UI_DATA** * *ui_dat*)

7.24.3.6 bool exec (const std::string & *input*)

7.24.3.7 int exec_loop (**UI_DATA** * *ui_dat*)

7.24.3.8 void exec_option (**UI_DATA** * *ui_dat*)

7.24.3.9 bool exit (const std::string & *input*)

7.24.3.10 bool help (const std::string & *input*)

7.24.3.11 bool input (const std::string & *input*)

7.24.3.12 int invalid_input (int *count,* int *max*)

7.24.3.13 int number_files (**UI_DATA** * *ui_dat*)

7.24.3.14 bool path (const std::string & *input*)

7.24.3.15 int run_exec (UI_DATA * *ui_dat*)

7.24.3.16 int run_executable (int *argc*, const char * *argv[]*)

7.24.3.17 int run_test (UI_DATA * *ui_dat*)

7.24.3.18 bool test (const std::string & *input*)

7.24.3.19 int test_loop (UI_DATA * *ui_dat*)

7.24.3.20 bool valid_addon_options (UI_DATA * *ui_dat*)

7.24.3.21 bool valid_exec_string (const std::string & *input*, UI_DATA * *ui_dat*)

7.24.3.22 bool valid_input_execute (UI_DATA * *ui_dat*)

7.24.3.23 bool valid_input_main (UI_DATA * *ui_dat*)

7.24.3.24 bool valid_input_tests (UI_DATA * *ui_dat*)

7.24.3.25 bool valid_test_string (const std::string & *input*, UI_DATA * *ui_dat*)

7.24.3.26 bool version (const std::string & *input*)

7.25 /Users/aladshaw3/projects/ecosystem/include/yaml.h File Reference

Public interface for libyaml.

```
#include "config.h"
#include <stdlib.h>
#include <stdio.h>
#include <string.h>
```

Classes

- struct yaml_version_directive_s
- struct yaml_tag_directive_s
- struct yaml_mark_s
- struct yaml_token_s
- struct yaml_event_s
- struct yaml_node_pair_s
- struct yaml_node_s
- struct yaml_document_s
- struct yaml_simple_key_s
- struct yaml_alias_data_s
- struct yaml_parser_s
- struct yaml_emitter_s

Macros

- #define YAML_DECLARE(type) type
- #define YAML_NULL_TAG "tag:yaml.org,2002:null"

- #define YAML_BOOL_TAG "tag:yaml.org,2002:bool"
- #define YAML_STR_TAG "tag:yaml.org,2002:str"
- #define YAML_INT_TAG "tag:yaml.org,2002:int"
- #define YAML_FLOAT_TAG "tag:yaml.org,2002:float"
- #define YAML_TIMESTAMP_TAG "tag:yaml.org,2002:timestamp"
- #define YAML_SEQ_TAG "tag:yaml.org,2002:seq"
- #define YAML_MAP_TAG "tag:yaml.org,2002:map"
- #define YAML_DEFAULT_SCALAR_TAG YAML_STR_TAG
- #define YAML_DEFAULT_SEQUENCE_TAG YAML_SEQ_TAG
- #define YAML_DEFAULT_MAPPING_TAG YAML_MAP_TAG

Typedefs

- typedef unsigned char yaml_char_t
- typedef struct yaml_version_directive_s yaml_version_directive_t
- typedef struct yaml_tag_directive_s yaml_tag_directive_t
- typedef enum yaml_encoding_e yaml_encoding_t
- typedef enum yaml_break_e yaml_break_t
- typedef enum yaml_error_type_e yaml_error_type_t
- typedef struct yaml_mark_s yaml_mark_t
- typedef enum yaml_scalar_style_e yaml_scalar_style_t
- typedef enum yaml_sequence_style_e yaml_sequence_style_t
- typedef enum yaml_mapping_style_e yaml_mapping_style_t
- typedef enum yaml_token_type_e yaml_token_type_t
- typedef struct yaml_token_s yaml_token_t
- typedef enum yaml_event_type_e yaml_event_type_t
- typedef struct yaml_event_s yaml_event_t
- typedef enum yaml_node_type_e yaml_node_type_t
- typedef struct yaml_node_s yaml_node_t
- typedef int yaml_node_item_t
- typedef struct yaml_node_pair_s yaml_node_pair_t
- typedef struct yaml_document_s yaml_document_t
- typedef int yaml_read_handler_t (void *data, unsigned char *buffer, size_t size, size_t *size_read)
- typedef struct yaml_simple_key_s yaml_simple_key_t
- typedef enum yaml_parser_state_e yaml_parser_state_t
- typedef struct yaml_alias_data_s yaml_alias_data_t
- typedef struct yaml_parser_s yaml_parser_t
- typedef int yaml_write_handler_t (void *data, unsigned char *buffer, size_t size)
- typedef enum yaml_emitter_state_e yaml_emitter_state_t
- typedef struct yaml_emitter_s yaml_emitter_t

Enumerations

- enum yaml_encoding_e { YAML_ANY_ENCODING, YAML_UTF8_ENCODING, YAML_UTF16LE_ENCODING, YAML_UTF16BE_ENCODING }
- enum yaml_break_e { YAML_ANY_BREAK, YAML_CR_BREAK, YAML_LN_BREAK, YAML_CRLN_BREAK }
- enum yaml_error_type_e { YAML_NO_ERROR, YAML_MEMORY_ERROR, YAML_READER_ERROR, YAML_SCANNER_ERROR, YAML_PARSER_ERROR, YAML_COMPOSER_ERROR, YAML_WRITER_ERROR, YAML_EMITTER_ERROR }

- enum yaml_scalar_style_e {
  YAML_ANY_SCALAR_STYLE, YAML_PLAIN_SCALAR_STYLE, YAML_SINGLE_QUOTED_SCALAR_STYLE, YAML_DOUBLE_QUOTED_SCALAR_STYLE,
  YAML_LITERAL_SCALAR_STYLE, YAML_FOLDED_SCALAR_STYLE }
- enum yaml_sequence_style_e { YAML_ANY_SEQUENCE_STYLE, YAML_BLOCK_SEQUENCE_STYLE, YAML_FLOW_SEQUENCE_STYLE }
- enum yaml_mapping_style_e { YAML_ANY_MAPPING_STYLE, YAML_BLOCK_MAPPING_STYLE, YAML_FLOW_MAPPING_STYLE }
- enum yaml_token_type_e {
  YAML_NO_TOKEN, YAML_STREAM_START_TOKEN, YAML_STREAM_END_TOKEN, YAML_VERSION_DIRECTIVE_TOKEN,
  YAML_TAG_DIRECTIVE_TOKEN, YAML_DOCUMENT_START_TOKEN, YAML_DOCUMENT_END_TOKEN, YAML_BLOCK_SEQUENCE_START_TOKEN,
  YAML_BLOCK_MAPPING_START_TOKEN, YAML_BLOCK_END_TOKEN, YAML_FLOW_SEQUENCE_START_TOKEN, YAML_FLOW_SEQUENCE_END_TOKEN,
  YAML_FLOW_MAPPING_START_TOKEN, YAML_FLOW_MAPPING_END_TOKEN, YAML_BLOCK_ENTRY_TOKEN, YAML_FLOW_ENTRY_TOKEN,
  YAML_KEY_TOKEN, YAML_VALUE_TOKEN, YAML_ALIAS_TOKEN, YAML_ANCHOR_TOKEN,
  YAML_TAG_TOKEN, YAML_SCALAR_TOKEN }
- enum yaml_event_type_e {
  YAML_NO_EVENT, YAML_STREAM_START_EVENT, YAML_STREAM_END_EVENT, YAML_DOCUMENT_START_EVENT,
  YAML_DOCUMENT_END_EVENT, YAML_ALIAS_EVENT, YAML_SCALAR_EVENT, YAML_SEQUENCE_START_EVENT,
  YAML_SEQUENCE_END_EVENT, YAML_MAPPING_START_EVENT, YAML_MAPPING_END_EVENT }
- enum yaml_node_type_e { YAML_NO_NODE, YAML_SCALAR_NODE, YAML_SEQUENCE_NODE, YAML_MAPPING_NODE }
- enum yaml_parser_state_e {
  YAML_PARSE_STREAM_START_STATE, YAML_PARSE_IMPLICIT_DOCUMENT_START_STATE, YAML_PARSE_DOCUMENT_START_STATE, YAML_PARSE_DOCUMENT_CONTENT_STATE,
  YAML_PARSE_DOCUMENT_END_STATE, YAML_PARSE_BLOCK_NODE_STATE, YAML_PARSE_BLOCK_NODE_OR_INDENTLESS_SEQUENCE_STATE, YAML_PARSE_FLOW_NODE_STATE,
  YAML_PARSE_BLOCK_SEQUENCE_FIRST_ENTRY_STATE, YAML_PARSE_BLOCK_SEQUENCE_ENTRY_STATE, YAML_PARSE_INDENTLESS_SEQUENCE_ENTRY_STATE, YAML_PARSE_BLOCK_MAPPING_FIRST_KEY_STATE,
  YAML_PARSE_BLOCK_MAPPING_KEY_STATE, YAML_PARSE_BLOCK_MAPPING_VALUE_STATE, YAML_PARSE_FLOW_SEQUENCE_FIRST_ENTRY_STATE, YAML_PARSE_FLOW_SEQUENCE_ENTRY_STATE,
  YAML_PARSE_FLOW_SEQUENCE_ENTRY_MAPPING_KEY_STATE, YAML_PARSE_FLOW_SEQUENCE_ENTRY_MAPPING_VALUE_STATE, YAML_PARSE_FLOW_SEQUENCE_ENTRY_MAPPING_END_STATE, YAML_PARSE_FLOW_MAPPING_FIRST_KEY_STATE,
  YAML_PARSE_FLOW_MAPPING_KEY_STATE, YAML_PARSE_FLOW_MAPPING_VALUE_STATE, YAML_PARSE_FLOW_MAPPING_EMPTY_VALUE_STATE, YAML_PARSE_END_STATE }
- enum yaml_emitter_state_e {
  YAML_EMIT_STREAM_START_STATE, YAML_EMIT_FIRST_DOCUMENT_START_STATE, YAML_EMIT_DOCUMENT_START_STATE, YAML_EMIT_DOCUMENT_CONTENT_STATE,
  YAML_EMIT_DOCUMENT_END_STATE, YAML_EMIT_FLOW_SEQUENCE_FIRST_ITEM_STATE, YAML_EMIT_FLOW_SEQUENCE_ITEM_STATE, YAML_EMIT_FLOW_MAPPING_FIRST_KEY_STATE,
  YAML_EMIT_FLOW_MAPPING_KEY_STATE, YAML_EMIT_FLOW_MAPPING_SIMPLE_VALUE_STATE, YAML_EMIT_FLOW_MAPPING_VALUE_STATE, YAML_EMIT_BLOCK_SEQUENCE_FIRST_ITEM_STATE,
  YAML_EMIT_BLOCK_SEQUENCE_ITEM_STATE, YAML_EMIT_BLOCK_MAPPING_FIRST_KEY_STATE, YAML_EMIT_BLOCK_MAPPING_KEY_STATE, YAML_EMIT_BLOCK_MAPPING_SIMPLE_VALUE_STATE,
  YAML_EMIT_BLOCK_MAPPING_VALUE_STATE, YAML_EMIT_END_STATE }

Functions

- yaml_get_version_string (void)
- yaml_get_version (int *major, int *minor, int *patch)
- yaml_token_delete (yaml_token_t *token)
- yaml_stream_start_event_initialize (yaml_event_t *event, yaml_encoding_t encoding)
- yaml_stream_end_event_initialize (yaml_event_t *event)
- yaml_document_start_event_initialize (yaml_event_t *event, yaml_version_directive_t *version_directive, yaml_tag_directive_t *tag_directives_start, yaml_tag_directive_t *tag_directives_end, int implicit)
- yaml_document_end_event_initialize (yaml_event_t *event, int implicit)
- yaml_alias_event_initialize (yaml_event_t *event, yaml_char_t *anchor)
- yaml_scalar_event_initialize (yaml_event_t *event, yaml_char_t *anchor, yaml_char_t *tag, yaml_char_t *value, int length, int plain_implicit, int quoted_implicit, yaml_scalar_style_t style)
- yaml_sequence_start_event_initialize (yaml_event_t *event, yaml_char_t *anchor, yaml_char_t *tag, int implicit, yaml_sequence_style_t style)
- yaml_sequence_end_event_initialize (yaml_event_t *event)
- yaml_mapping_start_event_initialize (yaml_event_t *event, yaml_char_t *anchor, yaml_char_t *tag, int implicit, yaml_mapping_style_t style)
- yaml_mapping_end_event_initialize (yaml_event_t *event)
- yaml_event_delete (yaml_event_t *event)
- yaml_document_initialize (yaml_document_t *document, yaml_version_directive_t *version_directive, yaml_tag_directive_t *tag_directives_start, yaml_tag_directive_t *tag_directives_end, int start_implicit, int end_implicit)
- yaml_document_delete (yaml_document_t *document)
- yaml_document_get_node (yaml_document_t *document, int index)
- yaml_document_get_root_node (yaml_document_t *document)
- yaml_document_add_scalar (yaml_document_t *document, yaml_char_t *tag, yaml_char_t *value, int length, yaml_scalar_style_t style)
- yaml_document_add_sequence (yaml_document_t *document, yaml_char_t *tag, yaml_sequence_style_t style)
- yaml_document_add_mapping (yaml_document_t *document, yaml_char_t *tag, yaml_mapping_style_t style)
- yaml_document_append_sequence_item (yaml_document_t *document, int sequence, int item)
- yaml_document_append_mapping_pair (yaml_document_t *document, int mapping, int key, int value)
- yaml_parser_initialize (yaml_parser_t *parser)
- yaml_parser_delete (yaml_parser_t *parser)
- yaml_parser_set_input_string (yaml_parser_t *parser, const unsigned char *input, size_t size)
- yaml_parser_set_input_file (yaml_parser_t *parser, FILE *file)
- yaml_parser_set_input (yaml_parser_t *parser, yaml_read_handler_t *handler, void *data)
- yaml_parser_set_encoding (yaml_parser_t *parser, yaml_encoding_t encoding)
- yaml_parser_scan (yaml_parser_t *parser, yaml_token_t *token)
- yaml_parser_parse (yaml_parser_t *parser, yaml_event_t *event)
- yaml_parser_load (yaml_parser_t *parser, yaml_document_t *document)
- yaml_emitter_initialize (yaml_emitter_t *emitter)
- yaml_emitter_delete (yaml_emitter_t *emitter)
- yaml_emitter_set_output_string (yaml_emitter_t *emitter, unsigned char *output, size_t size, size_t *size_written)
- yaml_emitter_set_output_file (yaml_emitter_t *emitter, FILE *file)
- yaml_emitter_set_output (yaml_emitter_t *emitter, yaml_write_handler_t *handler, void *data)
- yaml_emitter_set_encoding (yaml_emitter_t *emitter, yaml_encoding_t encoding)
- yaml_emitter_set_canonical (yaml_emitter_t *emitter, int canonical)
- yaml_emitter_set_indent (yaml_emitter_t *emitter, int indent)
- yaml_emitter_set_width (yaml_emitter_t *emitter, int width)
- yaml_emitter_set_unicode (yaml_emitter_t *emitter, int unicode)
- yaml_emitter_set_break (yaml_emitter_t *emitter, yaml_break_t line_break)

- yaml_emitter_emit (yaml_emitter_t *emitter, yaml_event_t *event)
- yaml_emitter_open (yaml_emitter_t *emitter)
- yaml_emitter_close (yaml_emitter_t *emitter)
- yaml_emitter_dump (yaml_emitter_t *emitter, yaml_document_t *document)
- yaml_emitter_flush (yaml_emitter_t *emitter)

7.25.1 Detailed Description

Public interface for libyaml. Include the header file with the code:

```
#include <yaml.h>
```

7.26 /Users/aladshaw3/projects/ecosystem/include/yaml_private.h File Reference

```
#include "yaml.h"
#include <assert.h>
#include <limits.h>
#include <stddef.h>
#include <stdint.h>
```

Classes

- struct yaml_string_t

Macros

- #define INPUT_RAW_BUFFER_SIZE 16384
- #define INPUT_BUFFER_SIZE (INPUT_RAW_BUFFER_SIZE*3)
- #define OUTPUT_BUFFER_SIZE 16384
- #define OUTPUT_RAW_BUFFER_SIZE (OUTPUT_BUFFER_SIZE*2+2)
- #define INITIAL_STACK_SIZE 16
- #define INITIAL_QUEUE_SIZE 16
- #define INITIAL_STRING_SIZE 16
- #define BUFFER_INIT(context, buffer, size)
- #define BUFFER_DEL(context, buffer)
- #define NULL_STRING { NULL, NULL, NULL }
- #define STRING(string, length) { (string), (string)+(length), (string) }
- #define STRING_ASSIGN(value, string, length)
- #define STRING_INIT(context, string, size)
- #define STRING_DEL(context, string)
- #define STRING_EXTEND(context, string)
- #define CLEAR(context, string)
- #define JOIN(context, string_a, string_b)
- #define CHECK_AT(string, octet, offset) ((string).pointer[offset] == (yaml_char_t)(octet))
- #define CHECK(string, octet) CHECK_AT((string),(octet),0)
- #define IS_ALPHA_AT(string, offset)
- #define IS_ALPHA(string) IS_ALPHA_AT((string),0)
- #define IS_DIGIT_AT(string, offset)
- #define IS_DIGIT(string) IS_DIGIT_AT((string),0)
- #define AS_DIGIT_AT(string, offset) ((string).pointer[offset] - (yaml_char_t) '0')
- #define AS_DIGIT(string) AS_DIGIT_AT((string),0)

- #define IS_HEX_AT(string, offset)
- #define IS_HEX(string) IS_HEX_AT((string),0)
- #define AS_HEX_AT(string, offset)
- #define AS_HEX(string) AS_HEX_AT((string),0)
- #define IS_ASCII_AT(string, offset) ((string).pointer[offset] <= (yaml_char_t) '\x7F')
- #define IS_ASCII(string) IS_ASCII_AT((string),0)
- #define IS_PRINTABLE_AT(string, offset)
- #define IS_PRINTABLE(string) IS_PRINTABLE_AT((string),0)
- #define IS_Z_AT(string, offset) CHECK_AT((string),'\0',(offset))
- #define IS_Z(string) IS_Z_AT((string),0)
- #define IS_BOM_AT(string, offset)
- #define IS_BOM(string) IS_BOM_AT(string,0)
- #define IS_SPACE_AT(string, offset) CHECK_AT((string),' ',(offset))
- #define IS_SPACE(string) IS_SPACE_AT((string),0)
- #define IS_TAB_AT(string, offset) CHECK_AT((string),'\t',(offset))
- #define IS_TAB(string) IS_TAB_AT((string),0)
- #define IS_BLANK_AT(string, offset) (IS_SPACE_AT((string),(offset)) || IS_TAB_AT((string),(offset)))
- #define IS_BLANK(string) IS_BLANK_AT((string),0)
- #define IS_BREAK_AT(string, offset)
- #define IS_BREAK(string) IS_BREAK_AT((string),0)
- #define IS_CRLF_AT(string, offset) (CHECK_AT((string),'\r',(offset)) && CHECK_AT((string),'\n',(offset)+1))
- #define IS_CRLF(string) IS_CRLF_AT((string),0)
- #define IS_BREAKZ_AT(string, offset) (IS_BREAK_AT((string),(offset)) || IS_Z_AT((string),(offset)))
- #define IS_BREAKZ(string) IS_BREAKZ_AT((string),0)
- #define IS_SPACEZ_AT(string, offset) (IS_SPACE_AT((string),(offset)) || IS_BREAKZ_AT((string),(offset)))
- #define IS_SPACEZ(string) IS_SPACEZ_AT((string),0)
- #define IS_BLANKZ_AT(string, offset) (IS_BLANK_AT((string),(offset)) || IS_BREAKZ_AT((string),(offset)))
- #define IS_BLANKZ(string) IS_BLANKZ_AT((string),0)
- #define WIDTH_AT(string, offset)
- #define WIDTH(string) WIDTH_AT((string),0)
- #define MOVE(string) ((string).pointer += WIDTH((string)))
- #define COPY(string_a, string_b)
- #define STACK_INIT(context, stack, size)
- #define STACK_DEL(context, stack)
- #define STACK_EMPTY(context, stack) ((stack).start == (stack).top)
- #define STACK_LIMIT(context, stack, size)
- #define PUSH(context, stack, value)
- #define POP(context, stack) (*(--(stack).top))
- #define QUEUE_INIT(context, queue, size)
- #define QUEUE_DEL(context, queue)
- #define QUEUE_EMPTY(context, queue) ((queue).head == (queue).tail)
- #define ENQUEUE(context, queue, value)
- #define DEQUEUE(context, queue) (*((queue).head++))
- #define QUEUE_INSERT(context, queue, index, value)
- #define TOKEN_INIT(token, token_type, token_start_mark, token_end_mark)
- #define STREAM_START_TOKEN_INIT(token, token_encoding, start_mark, end_mark)
- #define STREAM_END_TOKEN_INIT(token, start_mark, end_mark) (TOKEN_INIT((token),YAML_STREAM_END_TOKEN,(start_mark),(end_mark)))
- #define ALIAS_TOKEN_INIT(token, token_value, start_mark, end_mark)
- #define ANCHOR_TOKEN_INIT(token, token_value, start_mark, end_mark)
- #define TAG_TOKEN_INIT(token, token_handle, token_suffix, start_mark, end_mark)
- #define SCALAR_TOKEN_INIT(token, token_value, token_length, token_style, start_mark, end_mark)
- #define VERSION_DIRECTIVE_TOKEN_INIT(token, token_major, token_minor, start_mark, end_mark)
- #define TAG_DIRECTIVE_TOKEN_INIT(token, token_handle, token_prefix, start_mark, end_mark)
- #define EVENT_INIT(event, event_type, event_start_mark, event_end_mark)

- #define STREAM_START_EVENT_INIT(event, event_encoding, start_mark, end_mark)
- #define STREAM_END_EVENT_INIT(event, start_mark, end_mark) (EVENT_INIT((event),YAML_STREAM_END_EVENT,(start_mark),(end_mark)))
- #define DOCUMENT_START_EVENT_INIT(event, event_version_directive,event_tag_directives_start, event_tag_directives_end, event_implicit, start_mark, end_mark)
- #define DOCUMENT_END_EVENT_INIT(event, event_implicit, start_mark, end_mark)
- #define ALIAS_EVENT_INIT(event, event_anchor, start_mark, end_mark)
- #define SCALAR_EVENT_INIT(event, event_anchor, event_tag, event_value, event_length,event_plain_implicit, event_quoted_implicit, event_style, start_mark, end_mark)
- #define SEQUENCE_START_EVENT_INIT(event, event_anchor, event_tag,event_implicit, event_style, start_mark, end_mark)
- #define SEQUENCE_END_EVENT_INIT(event, start_mark, end_mark) (EVENT_INIT((event),YAML_SEQUENCE_END_EVENT,(start_mark),(end_mark)))
- #define MAPPING_START_EVENT_INIT(event, event_anchor, event_tag,event_implicit, event_style, start_mark, end_mark)
- #define MAPPING_END_EVENT_INIT(event, start_mark, end_mark) (EVENT_INIT((event),YAML_MAPPING_END_EVENT,(start_mark),(end_mark)))
- #define DOCUMENT_INIT(document, document_nodes_start, document_nodes_end,document_version_directive, document_tag_directives_start,document_tag_directives_end, document_start_implicit,document_end_implicit, document_start_mark, document_end_mark)
- #define NODE_INIT(node, node_type, node_tag, node_start_mark, node_end_mark)
- #define SCALAR_NODE_INIT(node, node_tag, node_value, node_length,node_style, start_mark, end_mark)
- #define SEQUENCE_NODE_INIT(node, node_tag, node_items_start, node_items_end,node_style, start_mark, end_mark)
- #define MAPPING_NODE_INIT(node, node_tag, node_pairs_start, node_pairs_end,node_style, start_mark, end_mark)

Functions

- yaml_malloc (size_t size)
- yaml_realloc (void *ptr, size_t size)
- yaml_free (void *ptr)
- yaml_strdup (const yaml_char_t *)
- yaml_parser_update_buffer (yaml_parser_t *parser, size_t length)
- yaml_parser_fetch_more_tokens (yaml_parser_t *parser)
- yaml_string_extend (yaml_char_t **start, yaml_char_t **pointer, yaml_char_t **end)
- yaml_string_join (yaml_char_t **a_start, yaml_char_t **a_pointer, yaml_char_t **a_end, yaml_char_t **b_start, yaml_char_t **b_pointer, yaml_char_t **b_end)
- yaml_stack_extend (void **start, void **top, void **end)
- yaml_queue_extend (void **start, void **head, void **tail, void **end)

7.26.1 Macro Definition Documentation

7.26.1.1 #define ALIAS_EVENT_INIT(*event, event_anchor, start_mark, end_mark*)

Value:

```
(EVENT_INIT((event),YAML_ALIAS_EVENT,(start_mark),(end_mark)),              \
     (event).data.alias.anchor = (event_anchor))
```

7.26.1.2 #define ALIAS_TOKEN_INIT(*token, token_value, start_mark, end_mark*)

Value:

```
(TOKEN_INIT((token),YAML_ALIAS_TOKEN,(start_mark),(end_mark)),              \
     (token).data.alias.value = (token_value))
```

7.26.1.3 #define ANCHOR_TOKEN_INIT(*token, token_value, start_mark, end_mark*)

Value:

```
(TOKEN_INIT((token),YAML_ANCHOR_TOKEN,(start_mark),(end_mark)),             \
     (token).data.anchor.value = (token_value))
```

7.26.1.4 #define AS_DIGIT(*string*) AS_DIGIT_AT((string),0)

7.26.1.5 #define AS_DIGIT_AT(*string, offset*) ((string).pointer[offset] - (yaml_char_t) '0')

7.26.1.6 #define AS_HEX(*string*) AS_HEX_AT((string),0)

7.26.1.7 #define AS_HEX_AT(*string, offset*)

Value:

```
(((string).pointer[offset] >= (yaml_char_t) 'A' &&                          \
        (string).pointer[offset] <= (yaml_char_t) 'F') ?                    \
       ((string).pointer[offset] - (yaml_char_t) 'A' + 10) :                \
       ((string).pointer[offset] >= (yaml_char_t) 'a' &&                    \
        (string).pointer[offset] <= (yaml_char_t) 'f') ?                    \
       ((string).pointer[offset] - (yaml_char_t) 'a' + 10) :                \
       ((string).pointer[offset] - (yaml_char_t) '0'))
```

7.26.1.8 #define BUFFER_DEL(*context, buffer*)

Value:

```
(yaml_free((buffer).start),                                                 \
     (buffer).start = (buffer).pointer = (buffer).end = 0)
```

7.26.1.9 #define BUFFER_INIT(*context, buffer, size*)

Value:

```
(((buffer).start = yaml_malloc(size)) ?                                     \
        ((buffer).last = (buffer).pointer = (buffer).start,                 \
         (buffer).end = (buffer).start+(size),                              \
         1) :                                                               \
        ((context)->error = YAML_MEMORY_ERROR,                             \
         0))
```

7.26.1.10 #define CHECK(*string, octet*) CHECK_AT((string),(octet),0)

7.26.1.11 #define CHECK_AT(*string, octet, offset*) ((string).pointer[offset] == (yaml_char_t)(octet))

7.26.1.12 #define CLEAR(*context, string*)

Value:

```
((string).pointer = (string).start,                                     \
     memset((string).start, 0, (string).end-(string).start))
```

7.26.1.13 #define COPY(*string_a*, *string_b*)

Value:

```
((*(string_b).pointer & 0x80) == 0x00 ?                                 \
     (*((string_a).pointer++) = *((string_b).pointer++)) :                  \
     (*(string_b).pointer & 0xE0) == 0xC0 ?                             \
     (*((string_a).pointer++) = *((string_b).pointer++),                \
      *((string_a).pointer++) = *((string_b).pointer++)) :              \
     (*(string_b).pointer & 0xF0) == 0xE0 ?                             \
     (*((string_a).pointer++) = *((string_b).pointer++),                \
      *((string_a).pointer++) = *((string_b).pointer++),                \
      *((string_a).pointer++) = *((string_b).pointer++)) :              \
     (*(string_b).pointer & 0xF8) == 0xF0 ?                             \
     (*((string_a).pointer++) = *((string_b).pointer++),                \
      *((string_a).pointer++) = *((string_b).pointer++),                \
      *((string_a).pointer++) = *((string_b).pointer++),                \
      *((string_a).pointer++) = *((string_b).pointer++)) : 0)
```

7.26.1.14 #define DEQUEUE(*context*, *queue*) (*((queue).head++))

7.26.1.15 #define DOCUMENT_END_EVENT_INIT(*event*, *event_implicit*, *start_mark*, *end_mark*)

Value:

```
(EVENT_INIT((event),YAML_DOCUMENT_END_EVENT,(start_mark),(end_mark)),
       \
     (event).data.document_end.implicit = (event_implicit))
```

7.26.1.16 #define DOCUMENT_INIT(*document*, *document_nodes_start*, *document_nodes_end*, *document_version_directive*, *document_tag_directives_start*, *document_tag_directives_end*, *document_start_implicit*, *document_end_implicit*, *document_start_mark*, *document_end_mark*)

Value:

```
(memset(&(document), 0, sizeof(yaml_document_t)),                       \
     (document).nodes.start = (document_nodes_start),                   \
     (document).nodes.end = (document_nodes_end),                       \
     (document).nodes.top = (document_nodes_start),                     \
     (document).version_directive = (document_version_directive),       \
     (document).tag_directives.start = (document_tag_directives_start), \
     (document).tag_directives.end = (document_tag_directives_end),     \
     (document).start_implicit = (document_start_implicit),             \
     (document).end_implicit = (document_end_implicit),                 \
     (document).start_mark = (document_start_mark),                     \
     (document).end_mark = (document_end_mark))
```

7.26.1.17 #define DOCUMENT_START_EVENT_INIT(*event*, *event_version_directive*, *event_tag_directives_start*, *event_tag_directives_end*, *event_implicit*, *start_mark*, *end_mark*)

Value:

```
(EVENT_INIT((event),YAML_DOCUMENT_START_EVENT,(start_mark),(end_mark)),
         \
     (event).data.document_start.version_directive = (event_version_directive), \
     (event).data.document_start.tag_directives.start = (event_tag_directives_start),   \
     (event).data.document_start.tag_directives.end = (event_tag_directives_end),   \
     (event).data.document_start.implicit = (event_implicit))
```

7.26.1.18 #define ENQUEUE(*context, queue, value*)

Value:

```
(((queue).tail != (queue).end                                                   \
      || yaml_queue_extend((void **)&(queue).start, (void **)&(queue).head,     \
          (void **)&(queue).tail, (void **)&(queue).end)) ?                     \
        (*((queue).tail++) = value,                                             \
         1) :                                                                   \
        ((context)->error = YAML_MEMORY_ERROR,                                 \
         0))
```

7.26.1.19 #define EVENT_INIT(*event, event_type, event_start_mark, event_end_mark*)

Value:

```
(memset(&(event), 0, sizeof(yaml_event_t)),                                     \
     (event).type = (event_type),                                               \
     (event).start_mark = (event_start_mark),                                   \
     (event).end_mark = (event_end_mark))
```

7.26.1.20 #define INITIAL_QUEUE_SIZE 16

7.26.1.21 #define INITIAL_STACK_SIZE 16

7.26.1.22 #define INITIAL_STRING_SIZE 16

7.26.1.23 #define INPUT_BUFFER_SIZE (INPUT_RAW_BUFFER_SIZE*3)

7.26.1.24 #define INPUT_RAW_BUFFER_SIZE 16384

7.26.1.25 #define IS_ALPHA(*string*) IS_ALPHA_AT((string),0)

7.26.1.26 #define IS_ALPHA_AT(*string, offset*)

Value:

```
(((string).pointer[offset] >= (yaml_char_t) '0' &&                              \
       (string).pointer[offset] <= (yaml_char_t) '9') ||                        \
      ((string).pointer[offset] >= (yaml_char_t) 'A' &&                         \
       (string).pointer[offset] <= (yaml_char_t) 'Z') ||                        \
      ((string).pointer[offset] >= (yaml_char_t) 'a' &&                         \
       (string).pointer[offset] <= (yaml_char_t) 'z') ||                        \
      (string).pointer[offset] == '_' ||                                        \
      (string).pointer[offset] == '-')
```

7.26.1.27 #define IS_ASCII(*string*) IS_ASCII_AT((string),0)

7.26.1.28 #define IS_ASCII_AT(*string, offset*) ((string).pointer[offset] <= (yaml_char_t) '\x7F')

7.26.1.29 #define IS_BLANK(*string*) IS_BLANK_AT((string),0)

7.26.1.30 #define IS_BLANK_AT(*string, offset*) (IS_SPACE_AT((string),(offset)) || IS_TAB_AT((string),(offset)))

7.26.1.31 #define IS_BLANKZ(*string*) IS_BLANKZ_AT((string),0)

7.26.1.32 #define IS_BLANKZ_AT(*string, offset*) (IS_BLANK_AT((string),(offset)) || IS_BREAKZ_AT((string),(offset)))

7.26.1.33 #define IS_BOM(*string*) IS_BOM_AT(string,0)

7.26.1.34 #define IS_BOM_AT(*string, offset*)

Value:

```
(CHECK_AT((string),'\xEF',(offset))                                     \
      && CHECK_AT((string),'\xBB',(offset)+1)                               \
      && CHECK_AT((string),'\xBF',(offset)+2))  /* BOM (#xFEFF) */
```

7.26.1.35 #define IS_BREAK(*string*) IS_BREAK_AT((string),0)

7.26.1.36 #define IS_BREAK_AT(*string, offset*)

Value:

```
(CHECK_AT((string),'\r',(offset))               /* CR (#xD)*/               \
     || CHECK_AT((string),'\n',(offset))            /* LF (#xA) */              \
     || (CHECK_AT((string),'\xC2',(offset))                                     \
         && CHECK_AT((string),'\x85',(offset)+1))   /* NEL (#x85) */            \
     || (CHECK_AT((string),'\xE2',(offset))                                     \
         && CHECK_AT((string),'\x80',(offset)+1)                                \
         && CHECK_AT((string),'\xA8',(offset)+2))   /* LS (#x2028) */           \
     || (CHECK_AT((string),'\xE2',(offset))                                     \
         && CHECK_AT((string),'\x80',(offset)+1)                                \
         && CHECK_AT((string),'\xA9',(offset)+2)))  /* PS (#x2029) */
```

7.26.1.37 #define IS_BREAKZ(*string*) IS_BREAKZ_AT((string),0)

7.26.1.38 #define IS_BREAKZ_AT(*string, offset*) (IS_BREAK_AT((string),(offset)) || IS_Z_AT((string),(offset)))

7.26.1.39 #define IS_CRLF(*string*) IS_CRLF_AT((string),0)

7.26.1.40 #define IS_CRLF_AT(*string, offset*) (CHECK_AT((string),'\r',(offset)) && CHECK_AT((string),'\n',(offset)+1))

7.26.1.41 #define IS_DIGIT(*string*) IS_DIGIT_AT((string),0)

7.26.1.42 #define IS_DIGIT_AT(*string, offset*)

Value:

```
(((string).pointer[offset] >= (yaml_char_t) '0' &&                      \
       (string).pointer[offset] <= (yaml_char_t) '9'))
```

7.26.1.43 #define IS_HEX(*string*) IS_HEX_AT((string),0)

7.26.1.44 #define IS_HEX_AT(*string, offset*)

Value:

```
(((string).pointer[offset] >= (yaml_char_t) '0' &&                      \
       (string).pointer[offset] <= (yaml_char_t) '9') ||                    \
      ((string).pointer[offset] >= (yaml_char_t) 'A' &&                     \
       (string).pointer[offset] <= (yaml_char_t) 'F') ||                    \
      ((string).pointer[offset] >= (yaml_char_t) 'a' &&                     \
       (string).pointer[offset] <= (yaml_char_t) 'f'))
```

7.26.1.45 #define IS_PRINTABLE(*string*) IS_PRINTABLE_AT((string),0)

7.26.1.46 #define IS_PRINTABLE_AT(*string, offset*)

Value:

```
(((string).pointer[offset] == 0x0A)          /* . == #x0A */                    \
     || ((string).pointer[offset] >= 0x20       /* #x20 <= . <= #x7E */          \
         && (string).pointer[offset] <= 0x7E)                                    \
     || ((string).pointer[offset] == 0xC2       /* #0xA0 <= . <= #xD7FF */       \
         && (string).pointer[offset+1] >= 0xA0)                                  \
     || ((string).pointer[offset] > 0xC2                                         \
         && (string).pointer[offset] < 0xED)                                     \
     || ((string).pointer[offset] == 0xED                                        \
         && (string).pointer[offset+1] < 0xA0)                                   \
     || ((string).pointer[offset] == 0xEE)                                       \
     || ((string).pointer[offset] == 0xEF      /* #xE000 <= . <= #xFFFD */       \
         && !((string).pointer[offset+1] == 0xBB        /* && . != #xFEFF */     \
             && (string).pointer[offset+2] == 0xBF)                              \
         && !((string).pointer[offset+1] == 0xBF                                 \
             && ((string).pointer[offset+2] == 0xBE                              \
                 || (string).pointer[offset+2] == 0xBF))))
```

7.26.1.47 #define IS_SPACE(*string*) IS_SPACE_AT((string),0)

7.26.1.48 #define IS_SPACE_AT(*string, offset*) CHECK_AT((string),' ',(offset))

7.26.1.49 #define IS_SPACEZ(*string*) IS_SPACEZ_AT((string),0)

7.26.1.50 #define IS_SPACEZ_AT(*string, offset*) (IS_SPACE_AT((string),(offset)) || IS_BREAKZ_AT((string),(offset)))

7.26.1.51 #define IS_TAB(*string*) IS_TAB_AT((string),0)

7.26.1.52 #define IS_TAB_AT(*string, offset*) CHECK_AT((string),'\t',(offset))

7.26.1.53 #define IS_Z(*string*) IS_Z_AT((string),0)

7.26.1.54 #define IS_Z_AT(*string, offset*) CHECK_AT((string),'\0',(offset))

7.26.1.55 #define JOIN(*context, string_a, string_b*)

Value:

```
((yaml_string_join(&(string_a).start, &(string_a).pointer,                  \
                   &(string_a).end, &(string_b).start,                      \
                   &(string_b).pointer, &(string_b).end)) ?                 \
        ((string_b).pointer = (string_b).start,                             \
         1) :                                                               \
        ((context)->error = YAML_MEMORY_ERROR,                              \
         0))
```

7.26.1.56 #define MAPPING_END_EVENT_INIT(*event, start_mark, end_mark*) (EVENT_INIT((event),YAML_MAPPING_-END_EVENT,(start_mark),(end_mark)))

7.26.1.57 #define MAPPING_NODE_INIT(*node, node_tag, node_pairs_start, node_pairs_end, node_style, start_mark, end_mark*)

Value:

```
(NODE_INIT((node),YAML_MAPPING_NODE,(node_tag),(start_mark),(end_mark)),    \
     (node).data.mapping.pairs.start = (node_pairs_start),                  \
     (node).data.mapping.pairs.end = (node_pairs_end),                      \
     (node).data.mapping.pairs.top = (node_pairs_start),                    \
     (node).data.mapping.style = (node_style))
```

7.26.1.58 #define MAPPING_START_EVENT_INIT(*event, event_anchor, event_tag, event_implicit, event_style, start_mark, end_mark*)

Value:

```
(EVENT_INIT((event),YAML_MAPPING_START_EVENT,(start_mark),(end_mark)),
        \
     (event).data.mapping_start.anchor = (event_anchor),                        \
     (event).data.mapping_start.tag = (event_tag),                              \
     (event).data.mapping_start.implicit = (event_implicit),                    \
     (event).data.mapping_start.style = (event_style))
```

7.26.1.59 #define MOVE(*string*) ((string).pointer += WIDTH((string)))

7.26.1.60 #define NODE_INIT(*node, node_type, node_tag, node_start_mark, node_end_mark*)

Value:

```
(memset(&(node), 0, sizeof(yaml_node_t)),                                       \
     (node).type = (node_type),                                                 \
     (node).tag = (node_tag),                                                   \
     (node).start_mark = (node_start_mark),                                     \
     (node).end_mark = (node_end_mark))
```

7.26.1.61 #define NULL_STRING { NULL, NULL, NULL }

7.26.1.62 #define OUTPUT_BUFFER_SIZE 16384

7.26.1.63 #define OUTPUT_RAW_BUFFER_SIZE (OUTPUT_BUFFER_SIZE*2+2)

7.26.1.64 #define POP(*context, stack*) (*(--(stack).top))

7.26.1.65 #define PUSH(*context, stack, value*)

Value:

```
(((stack).top != (stack).end                                                    \
      || yaml_stack_extend((void **)&(stack).start,                             \
             (void **)&(stack).top, (void **)&(stack).end)) ?                   \
        (*((stack).top++) = value,                                              \
         1) :                                                                   \
        ((context)->error = YAML_MEMORY_ERROR,                                 \
         0))
```

7.26.1.66 #define QUEUE_DEL(*context, queue*)

Value:

```
(yaml_free((queue).start),                                                      \
     (queue).start = (queue).head = (queue).tail = (queue).end = 0)
```

7.26.1.67 #define QUEUE_EMPTY(*context, queue*) ((queue).head == (queue).tail)

7.26.1.68 #define QUEUE_INIT(*context, queue, size*)

Value:

```
(((queue).start = yaml_malloc((size)*sizeof(*(queue).start))) ?             \
        ((queue).head = (queue).tail = (queue).start,                       \
         (queue).end = (queue).start+(size),                                \
         1) :                                                               \
        ((context)->error = YAML_MEMORY_ERROR,                             \
         0))
```

7.26.1.69 #define QUEUE_INSERT(*context, queue, index, value*)

Value:

```
(((queue).tail != (queue).end                                               \
      || yaml_queue_extend((void **)&(queue).start, (void **)&(queue).head,     \
          (void **)&(queue).tail, (void **)&(queue).end)) ?                 \
        (memmove((queue).head+(index)+1,(queue).head+(index),               \
            ((queue).tail-(queue).head-(index))*sizeof(*(queue).start)),    \
         *((queue).head+(index)) = value,                                   \
         (queue).tail++,                                                    \
         1) :                                                               \
        ((context)->error = YAML_MEMORY_ERROR,                             \
         0))
```

7.26.1.70 #define SCALAR_EVENT_INIT(*event, event_anchor, event_tag, event_value, event_length, event_plain_implicit, event_quoted_implicit, event_style, start_mark, end_mark*)

Value:

```
(EVENT_INIT((event),YAML_SCALAR_EVENT,(start_mark),(end_mark)),             \
     (event).data.scalar.anchor = (event_anchor),                           \
     (event).data.scalar.tag = (event_tag),                                 \
     (event).data.scalar.value = (event_value),                             \
     (event).data.scalar.length = (event_length),                           \
     (event).data.scalar.plain_implicit = (event_plain_implicit),           \
     (event).data.scalar.quoted_implicit = (event_quoted_implicit),         \
     (event).data.scalar.style = (event_style))
```

7.26.1.71 #define SCALAR_NODE_INIT(*node, node_tag, node_value, node_length, node_style, start_mark, end_mark*)

Value:

```
(NODE_INIT((node),YAML_SCALAR_NODE,(node_tag),(start_mark),(end_mark)),     \
     (node).data.scalar.value = (node_value),                               \
     (node).data.scalar.length = (node_length),                             \
     (node).data.scalar.style = (node_style))
```

7.26.1.72 #define SCALAR_TOKEN_INIT(*token, token_value, token_length, token_style, start_mark, end_mark*)

Value:

```
(TOKEN_INIT((token),YAML_SCALAR_TOKEN,(start_mark),(end_mark)),             \
     (token).data.scalar.value = (token_value),                             \
     (token).data.scalar.length = (token_length),                           \
     (token).data.scalar.style = (token_style))
```

7.26.1.73 #define SEQUENCE_END_EVENT_INIT(*event, start_mark, end_mark*) (EVENT_INIT((event),YAML_SEQUENCE_END_EVENT,(start_mark),(end_mark)))

7.26.1.74 #define SEQUENCE_NODE_INIT(*node, node_tag, node_items_start, node_items_end, node_style, start_mark, end_mark*)

Value:

```
(NODE_INIT((node),YAML_SEQUENCE_NODE,(node_tag),(start_mark),(end_mark)),    \
     (node).data.sequence.items.start = (node_items_start),                    \
     (node).data.sequence.items.end = (node_items_end),                        \
     (node).data.sequence.items.top = (node_items_start),                      \
     (node).data.sequence.style = (node_style))
```

7.26.1.75 #define SEQUENCE_START_EVENT_INIT(*event, event_anchor, event_tag, event_implicit, event_style, start_mark, end_mark*)

Value:

```
(EVENT_INIT((event),YAML_SEQUENCE_START_EVENT,(start_mark),(end_mark)),
          \
     (event).data.sequence_start.anchor = (event_anchor),                      \
     (event).data.sequence_start.tag = (event_tag),                            \
     (event).data.sequence_start.implicit = (event_implicit),                  \
     (event).data.sequence_start.style = (event_style))
```

7.26.1.76 #define STACK_DEL(*context, stack*)

Value:

```
(yaml_free((stack).start),                                                     \
     (stack).start = (stack).top = (stack).end = 0)
```

7.26.1.77 #define STACK_EMPTY(*context, stack*) ((stack).start == (stack).top)

7.26.1.78 #define STACK_INIT(*context, stack, size*)

Value:

```
(((stack).start = yaml_malloc((size)*sizeof(*(stack).start))) ?               \
        ((stack).top = (stack).start,                                          \
         (stack).end = (stack).start+(size),                                   \
         1) :                                                                  \
        ((context)->error = YAML_MEMORY_ERROR,                                \
         0))
```

7.26.1.79 #define STACK_LIMIT(*context, stack, size*)

Value:

```
((stack).top - (stack).start < (size) ?                                        \
        1 :                                                                    \
        ((context)->error = YAML_MEMORY_ERROR,                                 \
         0))
```

7.26.1.80 #define STREAM_END_EVENT_INIT(*event, start_mark, end_mark*) (EVENT_INIT((event),YAML_STREAM_END_EVENT,(start_mark),(end_mark)))

7.26.1.81 #define STREAM_END_TOKEN_INIT(*token, start_mark, end_mark*) (TOKEN_INIT((token),YAML_STREAM_END_TOKEN,(start_mark),(end_mark)))

7.26.1.82 #define STREAM_START_EVENT_INIT(*event, event_encoding, start_mark, end_mark*)

Value:

```
(EVENT_INIT((event),YAML_STREAM_START_EVENT,(start_mark),(end_mark)),
        \
     (event).data.stream_start.encoding = (event_encoding))
```

7.26.1.83 #define STREAM_START_TOKEN_INIT(*token, token_encoding, start_mark, end_mark*)

Value:

```
(TOKEN_INIT((token),YAML_STREAM_START_TOKEN,(start_mark),(end_mark)),
        \
     (token).data.stream_start.encoding = (token_encoding))
```

7.26.1.84 #define STRING(*string, length*) { (string), (string)+(length), (string) }

7.26.1.85 #define STRING_ASSIGN(*value, string, length*)

Value:

```
((value).start = (string),                                              \
     (value).end = (string)+(length),                                       \
     (value).pointer = (string))
```

7.26.1.86 #define STRING_DEL(*context, string*)

Value:

```
(yaml_free((string).start),                                             \
     (string).start = (string).pointer = (string).end = 0)
```

7.26.1.87 #define STRING_EXTEND(*context, string*)

Value:

```
(((string).pointer+5 < (string).end)                                    \
        || yaml_string_extend(&(string).start,                              \
            &(string).pointer, &(string).end))
```

7.26.1.88 #define STRING_INIT(*context, string, size*)

Value:

```
(((string).start = yaml_malloc(size)) ?                                 \
        ((string).pointer = (string).start,                                 \
         (string).end = (string).start+(size),                              \
         memset((string).start, 0, (size)),                                 \
         1) :                                                               \
        ((context)->error = YAML_MEMORY_ERROR,                              \
         0))
```

7.26.1.89 #define TAG_DIRECTIVE_TOKEN_INIT(*token, token_handle, token_prefix, start_mark, end_mark*)

Value:

```
(TOKEN_INIT((token),YAML_TAG_DIRECTIVE_TOKEN,(start_mark),(end_mark)),
        \
     (token).data.tag_directive.handle = (token_handle),                    \
     (token).data.tag_directive.prefix = (token_prefix))
```

7.26.1.90 #define TAG_TOKEN_INIT(*token, token_handle, token_suffix, start_mark, end_mark*)

Value:

```
(TOKEN_INIT((token),YAML_TAG_TOKEN,(start_mark),(end_mark)),                \
     (token).data.tag.handle = (token_handle),                                \
     (token).data.tag.suffix = (token_suffix))
```

7.26.1.91 #define TOKEN_INIT(*token, token_type, token_start_mark, token_end_mark*)

Value:

```
(memset(&(token), 0, sizeof(yaml_token_t)),                                  \
     (token).type = (token_type),                                             \
     (token).start_mark = (token_start_mark),                                 \
     (token).end_mark = (token_end_mark))
```

7.26.1.92 #define VERSION_DIRECTIVE_TOKEN_INIT(*token, token_major, token_minor, start_mark, end_mark*)

Value:

```
(TOKEN_INIT((token),YAML_VERSION_DIRECTIVE_TOKEN,(start_mark),(
     end_mark)),  \
     (token).data.version_directive.major = (token_major),                    \
     (token).data.version_directive.minor = (token_minor))
```

7.26.1.93 #define WIDTH(*string*) WIDTH_AT((string),0)

7.26.1.94 #define WIDTH_AT(*string, offset*)

Value:

```
(((string).pointer[offset] & 0x80) == 0x00 ? 1 :                             \
      ((string).pointer[offset] & 0xE0) == 0xC0 ? 2 :                        \
      ((string).pointer[offset] & 0xF0) == 0xE0 ? 3 :                        \
      ((string).pointer[offset] & 0xF8) == 0xF0 ? 4 : 0)
```

7.26.2 Function Documentation

7.26.2.1 yaml_free (void * *ptr*)

7.26.2.2 yaml_malloc (size_t *size*)

7.26.2.3 yaml_parser_fetch_more_tokens (yaml_parser_t * *parser*)

7.26.2.4 yaml_parser_update_buffer (yaml_parser_t * *parser,* size_t *length*)

7.26.2.5 yaml_queue_extend (void ** *start,* void ** *head,* void ** *tail,* void ** *end*)

7.26.2.6 yaml_realloc (void * *ptr,* size_t *size*)

7.26.2.7 yaml_stack_extend (void ** *start,* void ** *top,* void ** *end*)

7.26.2.8 yaml_strdup (const yaml_char_t *)

7.26.2.9 yaml_string_extend (yaml_char_t ** *start,* yaml_char_t ** *pointer,* yaml_char_t ** *end*)

7.26.2.10 yaml_string_join (yaml_char_t ** *a_start,* yaml_char_t ** *a_pointer,* yaml_char_t ** *a_end,* yaml_char_t ** *b_start,* yaml_char_t ** *b_pointer,* yaml_char_t ** *b_end*)

7.27 /Users/aladshaw3/projects/ecosystem/include/yaml_wrapper.h File Reference

```
#include "yaml.h"
#include "error.h"
#include <map>
#include <string>
#include <iostream>
#include <utility>
#include <stdexcept>
```

Classes

- class ValueTypePair
- class KeyValueMap
- class SubHeader
- class Header
- class Document
- class YamlWrapper
- class yaml_cpp_class

Typedefs

- typedef enum data_type data_type
- typedef enum header_state header_state

Enumerations

- enum data_type {
  STRING, BOOLEAN, DOUBLE, INT,
  UNKNOWN }
- enum header_state { ANCHOR, ALIAS, NONE }

Functions

- int YAML_WRAPPER_TESTS ()
- int YAML_CPP_TEST (const char *file)

7.27.1 Typedef Documentation

7.27.1.1 typedef enum data_type data_type

7.27.1.2 typedef enum header_state header_state

7.27.2 Enumeration Type Documentation

7.27.2.1 enum data_type

Enumerator

STRING

BOOLEAN

DOUBLE

INT

UNKNOWN

7.27.2.2 enum header_state

Enumerator

ANCHOR

ALIAS

NONE

7.27.3 Function Documentation

7.27.3.1 int YAML_CPP_TEST (const char * *file*)

7.27.3.2 int YAML_WRAPPER_TESTS ( )

7.28 /Users/aladshaw3/projects/ecosystem/src/api.c File Reference

```
#include "yaml_private.h"
```

Functions

- yaml_get_version_string (void)
- yaml_get_version (int *major, int *minor, int *patch)
- yaml_malloc (size_t size)
- yaml_realloc (void *ptr, size_t size)
- yaml_free (void *ptr)
- yaml_strdup (const yaml_char_t *str)
- yaml_string_extend (yaml_char_t **start, yaml_char_t **pointer, yaml_char_t **end)
- yaml_string_join (yaml_char_t **a_start, yaml_char_t **a_pointer, yaml_char_t **a_end, yaml_char_t **b_start, yaml_char_t **b_pointer, yaml_char_t **b_end)
- yaml_stack_extend (void **start, void **top, void **end)
- yaml_queue_extend (void **start, void **head, void **tail, void **end)
- yaml_parser_initialize (yaml_parser_t *parser)
- yaml_parser_delete (yaml_parser_t *parser)
- static int yaml_string_read_handler (void *data, unsigned char *buffer, size_t size, size_t *size_read)
- static int yaml_file_read_handler (void *data, unsigned char *buffer, size_t size, size_t *size_read)
- yaml_parser_set_input_string (yaml_parser_t *parser, const unsigned char *input, size_t size)
- yaml_parser_set_input_file (yaml_parser_t *parser, FILE *file)
- yaml_parser_set_input (yaml_parser_t *parser, yaml_read_handler_t *handler, void *data)
- yaml_parser_set_encoding (yaml_parser_t *parser, yaml_encoding_t encoding)
- yaml_emitter_initialize (yaml_emitter_t *emitter)
- yaml_emitter_delete (yaml_emitter_t *emitter)
- static int yaml_string_write_handler (void *data, unsigned char *buffer, size_t size)
- static int yaml_file_write_handler (void *data, unsigned char *buffer, size_t size)
- yaml_emitter_set_output_string (yaml_emitter_t *emitter, unsigned char *output, size_t size, size_t *size_written)
- yaml_emitter_set_output_file (yaml_emitter_t *emitter, FILE *file)

- yaml_emitter_set_output (yaml_emitter_t *emitter, yaml_write_handler_t *handler, void *data)
- yaml_emitter_set_encoding (yaml_emitter_t *emitter, yaml_encoding_t encoding)
- yaml_emitter_set_canonical (yaml_emitter_t *emitter, int canonical)
- yaml_emitter_set_indent (yaml_emitter_t *emitter, int indent)
- yaml_emitter_set_width (yaml_emitter_t *emitter, int width)
- yaml_emitter_set_unicode (yaml_emitter_t *emitter, int unicode)
- yaml_emitter_set_break (yaml_emitter_t *emitter, yaml_break_t line_break)
- yaml_token_delete (yaml_token_t *token)
- static int yaml_check_utf8 (yaml_char_t *start, size_t length)
- yaml_stream_start_event_initialize (yaml_event_t *event, yaml_encoding_t encoding)
- yaml_stream_end_event_initialize (yaml_event_t *event)
- yaml_document_start_event_initialize (yaml_event_t *event, yaml_version_directive_t *version_directive, yaml_tag_directive_t *tag_directives_start, yaml_tag_directive_t *tag_directives_end, int implicit)
- yaml_document_end_event_initialize (yaml_event_t *event, int implicit)
- yaml_alias_event_initialize (yaml_event_t *event, yaml_char_t *anchor)
- yaml_scalar_event_initialize (yaml_event_t *event, yaml_char_t *anchor, yaml_char_t *tag, yaml_char_t *value, int length, int plain_implicit, int quoted_implicit, yaml_scalar_style_t style)
- yaml_sequence_start_event_initialize (yaml_event_t *event, yaml_char_t *anchor, yaml_char_t *tag, int implicit, yaml_sequence_style_t style)
- yaml_sequence_end_event_initialize (yaml_event_t *event)
- yaml_mapping_start_event_initialize (yaml_event_t *event, yaml_char_t *anchor, yaml_char_t *tag, int implicit, yaml_mapping_style_t style)
- yaml_mapping_end_event_initialize (yaml_event_t *event)
- yaml_event_delete (yaml_event_t *event)
- yaml_document_initialize (yaml_document_t *document, yaml_version_directive_t *version_directive, yaml_tag_directive_t *tag_directives_start, yaml_tag_directive_t *tag_directives_end, int start_implicit, int end_implicit)
- yaml_document_delete (yaml_document_t *document)
- yaml_document_get_node (yaml_document_t *document, int index)
- yaml_document_get_root_node (yaml_document_t *document)
- yaml_document_add_scalar (yaml_document_t *document, yaml_char_t *tag, yaml_char_t *value, int length, yaml_scalar_style_t style)
- yaml_document_add_sequence (yaml_document_t *document, yaml_char_t *tag, yaml_sequence_style_t style)
- yaml_document_add_mapping (yaml_document_t *document, yaml_char_t *tag, yaml_mapping_style_t style)
- yaml_document_append_sequence_item (yaml_document_t *document, int sequence, int item)
- yaml_document_append_mapping_pair (yaml_document_t *document, int mapping, int key, int value)

7.28.1 Function Documentation

7.28.1.1 static int yaml_check_utf8 (yaml_char_t * *start*, size_t *length*) [static]

7.28.1.2 static int yaml_file_read_handler (void * *data*, unsigned char * *buffer*, size_t *size*, size_t * *size_read*) [static]

7.28.1.3 static int yaml_file_write_handler (void * *data*, unsigned char * *buffer*, size_t *size*) [static]

7.28.1.4 yaml_free (void * *ptr*)

7.28.1.5 yaml_malloc (size_t *size*)

7.28.1.6 yaml_queue_extend (void ** *start*, void ** *head*, void ** *tail*, void ** *end*)

7.28.1.7 yaml_realloc (void * *ptr*, size_t *size*)

7.28.1.8 yaml_stack_extend (void ** *start*, void ** *top*, void ** *end*)

7.28.1.9 yaml_strdup (const yaml_char_t * *str*)

7.28.1.10 yaml_string_extend (yaml_char_t ** *start*, yaml_char_t ** *pointer*, yaml_char_t ** *end*)

7.28.1.11 yaml_string_join (yaml_char_t ** *a_start*, yaml_char_t ** *a_pointer*, yaml_char_t ** *a_end*, yaml_char_t ** *b_start*, yaml_char_t ** *b_pointer*, yaml_char_t ** *b_end*)

7.28.1.12 static int yaml_string_read_handler (void * *data*, unsigned char * *buffer*, size_t *size*, size_t * *size_read*) [static]

7.28.1.13 static int yaml_string_write_handler (void * *data*, unsigned char * *buffer*, size_t *size*) [static]

7.29 /Users/aladshaw3/projects/ecosystem/src/dogfish.cpp File Reference

```
#include "dogfish.h"
```

Functions

- void print2file_species_header (FILE *Output, DOGFISH_DATA *dog_dat, int i)
- void print2file_DOGFISH_header (DOGFISH_DATA *dog_dat)
- void print2file_DOGFISH_result_old (DOGFISH_DATA *dog_dat)
- void print2file_DOGFISH_result_new (DOGFISH_DATA *dog_dat)
- double default_Retardation (int i, int l, const void *data)
- double default_IntraDiffusion (int i, int l, const void *data)
- double default_FilmMTCoeff (int i, const void *data)
- double default_SurfaceConcentration (int i, const void *data)
- int setup_DOGFISH_DATA (FILE *file, double(*eval_R)(int i, int l, const void *user_data), double(*eval_DI)(int i, int l, const void *user_data), double(*eval_kf)(int i, const void *user_data), double(*eval_qs)(int i, const void *user_data), const void *user_data, DOGFISH_DATA *dog_dat)
- int DOGFISH_Executioner (DOGFISH_DATA *dog_dat)
- int set_DOGFISH_ICs (DOGFISH_DATA *dog_dat)
- int set_DOGFISH_timestep (DOGFISH_DATA *dog_dat)
- int DOGFISH_preprocesses (DOGFISH_DATA *dog_dat)
- int set_DOGFISH_params (const void *user_data)
- int DOGFISH_postprocesses (DOGFISH_DATA *dog_dat)
- int DOGFISH_reset (DOGFISH_DATA *dog_dat)
- int DOGFISH (DOGFISH_DATA *dog_dat)
- int DOGFISH_TESTS ()

7.29.1 Function Documentation

7.29.1.1 double default_FilmMTCoeff (int *i*, const void * *data*)

7.29.1.2 double default_IntraDiffusion (int *i*, int *l*, const void * *data*)

7.29.1.3 double default_Retardation (int *i*, int *l*, const void * *data*)

7.29.1.4 double default_SurfaceConcentration (int *i*, const void * *data*)

7.29.1.5 int DOGFISH (DOGFISH_DATA * *dog_dat*)

7.29.1.6 int DOGFISH_Executioner (DOGFISH_DATA * *dog_dat*)

7.29.1.7 int DOGFISH_postprocesses (DOGFISH_DATA * *dog_dat*)

7.29.1.8 int DOGFISH_preprocesses (DOGFISH_DATA * *dog_dat*)

7.29.1.9 int DOGFISH_reset (DOGFISH_DATA * *dog_dat*)

7.29.1.10 int DOGFISH_TESTS ( )

7.29.1.11 void print2file_DOGFISH_header (DOGFISH_DATA * *dog_dat*)

7.29.1.12 void print2file_DOGFISH_result_new (DOGFISH_DATA * *dog_dat*)

7.29.1.13 void print2file_DOGFISH_result_old (DOGFISH_DATA * *dog_dat*)

7.29.1.14 void print2file_species_header (FILE * *Output,* DOGFISH_DATA * *dog_dat,* int *i*)

7.29.1.15 int set_DOGFISH_ICs (DOGFISH_DATA * *dog_dat*)

7.29.1.16 int set_DOGFISH_params (const void * *user_data*)

7.29.1.17 int set_DOGFISH_timestep (DOGFISH_DATA * *dog_dat*)

7.29.1.18 int setup_DOGFISH_DATA (FILE * *file,* double(*)(int i, int l, const void *user_data) *eval_R,* double(*)(int i, int l, const void *user_data) *eval_DI,* double(*)(int i, const void *user_data) *eval_kf,* double(*)(int i, const void *user_data) *eval_qs,* const void * *user_data,* DOGFISH_DATA * *dog_dat*)

7.30 /Users/aladshaw3/projects/ecosystem/src/dumper.c File Reference

```
#include "yaml_private.h"
```

Macros

- #define ANCHOR_TEMPLATE "id%03d"
- #define ANCHOR_TEMPLATE_LENGTH 16

Functions

- yaml_emitter_open (yaml_emitter_t *emitter)
- yaml_emitter_close (yaml_emitter_t *emitter)
- yaml_emitter_dump (yaml_emitter_t *emitter, yaml_document_t *document)
- static void yaml_emitter_delete_document_and_anchors (yaml_emitter_t *emitter)
- static void yaml_emitter_anchor_node (yaml_emitter_t *emitter, int index)
- static yaml_char_t * yaml_emitter_generate_anchor (yaml_emitter_t *emitter, int anchor_id)
- static int yaml_emitter_dump_node (yaml_emitter_t *emitter, int index)
- static int yaml_emitter_dump_alias (yaml_emitter_t *emitter, yaml_char_t *anchor)
- static int yaml_emitter_dump_scalar (yaml_emitter_t *emitter, yaml_node_t *node, yaml_char_t *anchor)
- static int yaml_emitter_dump_sequence (yaml_emitter_t *emitter, yaml_node_t *node, yaml_char_t *anchor)
- static int yaml_emitter_dump_mapping (yaml_emitter_t *emitter, yaml_node_t *node, yaml_char_t *anchor)

7.30.1 Macro Definition Documentation

7.30.1.1 #define ANCHOR_TEMPLATE "id%03d"

7.30.1.2 #define ANCHOR_TEMPLATE_LENGTH 16

7.30.2 Function Documentation

7.30.2.1 static void yaml_emitter_anchor_node (yaml_emitter_t * *emitter,* int *index*) [static]

7.30.2.2 static void yaml_emitter_delete_document_and_anchors (yaml_emitter_t * *emitter*) [static]

7.30.2.3 static int yaml_emitter_dump_alias (yaml_emitter_t * *emitter,* yaml_char_t * *anchor*) [static]

7.30.2.4 static int yaml_emitter_dump_mapping (yaml_emitter_t * *emitter,* yaml_node_t * *node,* yaml_char_t * *anchor*) [static]

7.30.2.5 static int yaml_emitter_dump_node (yaml_emitter_t * *emitter,* int *index*) [static]

7.30.2.6 static int yaml_emitter_dump_scalar (yaml_emitter_t * *emitter,* yaml_node_t * *node,* yaml_char_t * *anchor*) [static]

7.30.2.7 static int yaml_emitter_dump_sequence (yaml_emitter_t * *emitter,* yaml_node_t * *node,* yaml_char_t * *anchor*) [static]

7.30.2.8 static yaml_char_t * yaml_emitter_generate_anchor (yaml_emitter_t * *emitter,* int *anchor_id*) [static]

7.31 /Users/aladshaw3/projects/ecosystem/src/eel.cpp File Reference

```
#include "eel.h"
```

Functions

- int EEL_TESTS ()

7.31.1 Function Documentation

7.31.1.1 int EEL_TESTS ( )

7.32 /Users/aladshaw3/projects/ecosystem/src/egret.cpp File Reference

```
#include "egret.h"
```

Functions

- int initialize_data (int N, MIXED_GAS *gas_dat)
- int set_variables (double PT, double T, double us, double L, std::vector< double > &y, MIXED_GAS *gas_dat)
- int calculate_properties (MIXED_GAS *gas_dat)
- int EGRET_TESTS ()

7.32.1 Function Documentation

7.32.1.1 int calculate_properties (MIXED_GAS * gas_dat)

7.32.1.2 int EGRET_TESTS ( )

7.32.1.3 int initialize_data (int N, MIXED_GAS * gas_dat)

7.32.1.4 int set_variables (double PT, double T, double us, double L, std::vector< double > & y, MIXED_GAS * gas_dat)

7.33 /Users/aladshaw3/projects/ecosystem/src/emitter.c File Reference

```
#include "yaml_private.h"
```

Macros

- #define FLUSH(emitter)
- #define PUT(emitter, value)
- #define PUT_BREAK(emitter)
- #define WRITE(emitter, string)
- #define WRITE_BREAK(emitter, string)

Functions

- yaml_emitter_emit (yaml_emitter_t *emitter, yaml_event_t *event)
- static int yaml_emitter_set_emitter_error (yaml_emitter_t *emitter, const char *problem)
- static int yaml_emitter_need_more_events (yaml_emitter_t *emitter)
- static int yaml_emitter_append_tag_directive (yaml_emitter_t *emitter, yaml_tag_directive_t value, int allow_duplicates)
- static int yaml_emitter_increase_indent (yaml_emitter_t *emitter, int flow, int indentless)
- static int yaml_emitter_state_machine (yaml_emitter_t *emitter, yaml_event_t *event)
- static int yaml_emitter_emit_stream_start (yaml_emitter_t *emitter, yaml_event_t *event)
- static int yaml_emitter_emit_document_start (yaml_emitter_t *emitter, yaml_event_t *event, int first)
- static int yaml_emitter_emit_document_content (yaml_emitter_t *emitter, yaml_event_t *event)
- static int yaml_emitter_emit_document_end (yaml_emitter_t *emitter, yaml_event_t *event)
- static int yaml_emitter_emit_flow_sequence_item (yaml_emitter_t *emitter, yaml_event_t *event, int first)
- static int yaml_emitter_emit_flow_mapping_key (yaml_emitter_t *emitter, yaml_event_t *event, int first)
- static int yaml_emitter_emit_flow_mapping_value (yaml_emitter_t *emitter, yaml_event_t *event, int simple)
- static int yaml_emitter_emit_block_sequence_item (yaml_emitter_t *emitter, yaml_event_t *event, int first)
- static int yaml_emitter_emit_block_mapping_key (yaml_emitter_t *emitter, yaml_event_t *event, int first)
- static int yaml_emitter_emit_block_mapping_value (yaml_emitter_t *emitter, yaml_event_t *event, int simple)
- static int yaml_emitter_emit_node (yaml_emitter_t *emitter, yaml_event_t *event, int root, int sequence, int mapping, int simple_key)
- static int yaml_emitter_emit_alias (yaml_emitter_t *emitter, yaml_event_t *event)
- static int yaml_emitter_emit_scalar (yaml_emitter_t *emitter, yaml_event_t *event)
- static int yaml_emitter_emit_sequence_start (yaml_emitter_t *emitter, yaml_event_t *event)
- static int yaml_emitter_emit_mapping_start (yaml_emitter_t *emitter, yaml_event_t *event)
- static int yaml_emitter_check_empty_document (yaml_emitter_t *emitter)
- static int yaml_emitter_check_empty_sequence (yaml_emitter_t *emitter)
- static int yaml_emitter_check_empty_mapping (yaml_emitter_t *emitter)
- static int yaml_emitter_check_simple_key (yaml_emitter_t *emitter)
- static int yaml_emitter_select_scalar_style (yaml_emitter_t *emitter, yaml_event_t *event)

- static int yaml_emitter_process_anchor (yaml_emitter_t *emitter)
- static int yaml_emitter_process_tag (yaml_emitter_t *emitter)
- static int yaml_emitter_process_scalar (yaml_emitter_t *emitter)
- static int yaml_emitter_analyze_version_directive (yaml_emitter_t *emitter, yaml_version_directive_t version_directive)
- static int yaml_emitter_analyze_tag_directive (yaml_emitter_t *emitter, yaml_tag_directive_t tag_directive)
- static int yaml_emitter_analyze_anchor (yaml_emitter_t *emitter, yaml_char_t *anchor, int alias)
- static int yaml_emitter_analyze_tag (yaml_emitter_t *emitter, yaml_char_t *tag)
- static int yaml_emitter_analyze_scalar (yaml_emitter_t *emitter, yaml_char_t *value, size_t length)
- static int yaml_emitter_analyze_event (yaml_emitter_t *emitter, yaml_event_t *event)
- static int yaml_emitter_write_bom (yaml_emitter_t *emitter)
- static int yaml_emitter_write_indent (yaml_emitter_t *emitter)
- static int yaml_emitter_write_indicator (yaml_emitter_t *emitter, char *indicator, int need_whitespace, int is_whitespace, int is_indention)
- static int yaml_emitter_write_anchor (yaml_emitter_t *emitter, yaml_char_t *value, size_t length)
- static int yaml_emitter_write_tag_handle (yaml_emitter_t *emitter, yaml_char_t *value, size_t length)
- static int yaml_emitter_write_tag_content (yaml_emitter_t *emitter, yaml_char_t *value, size_t length, int need_whitespace)
- static int yaml_emitter_write_plain_scalar (yaml_emitter_t *emitter, yaml_char_t *value, size_t length, int allow_breaks)
- static int yaml_emitter_write_single_quoted_scalar (yaml_emitter_t *emitter, yaml_char_t *value, size_t length, int allow_breaks)
- static int yaml_emitter_write_double_quoted_scalar (yaml_emitter_t *emitter, yaml_char_t *value, size_t length, int allow_breaks)
- static int yaml_emitter_write_block_scalar_hints (yaml_emitter_t *emitter, yaml_string_t string)
- static int yaml_emitter_write_literal_scalar (yaml_emitter_t *emitter, yaml_char_t *value, size_t length)
- static int yaml_emitter_write_folded_scalar (yaml_emitter_t *emitter, yaml_char_t *value, size_t length)

7.33.1 Macro Definition Documentation

7.33.1.1 #define FLUSH(*emitter*)

Value:

```
((emitter->buffer.pointer+5 < emitter->buffer.end)                      \
     || yaml_emitter_flush(emitter))
```

7.33.1.2 #define PUT(*emitter, value*)

Value:

```
(FLUSH(emitter)                                                         \
     && (*(emitter->buffer.pointer++) = (yaml_char_t)(value),               \
         emitter->column ++,                                            \
         1))
```

7.33.1.3 #define PUT_BREAK(*emitter*)

Value:

```
(FLUSH(emitter)                                                         \
     && ((emitter->line_break == YAML_CR_BREAK ?                        \
             (*(emitter->buffer.pointer++) = (yaml_char_t) '\r') :      \
          emitter->line_break == YAML_LN_BREAK ?                        \
             (*(emitter->buffer.pointer++) = (yaml_char_t) '\n') :      \
          emitter->line_break == YAML_CRLN_BREAK ?                      \
```

```
            (*(emitter->buffer.pointer++) = (yaml_char_t) '\r',                 \
             *(emitter->buffer.pointer++) = (yaml_char_t) '\n') : 0),           \
        emitter->column = 0,                                                    \
        emitter->line ++,                                                       \
        1))
```

7.33.1.4 #define WRITE(*emitter, string*)

Value:

```
(FLUSH(emitter)                                                                 \
     && (COPY(emitter->buffer,string),                                          \
         emitter->column ++,                                                    \
         1))
```

7.33.1.5 #define WRITE_BREAK(*emitter, string*)

Value:

```
(FLUSH(emitter)                                                                 \
     && (CHECK(string,'\n') ?                                                   \
         (PUT_BREAK(emitter),                                                   \
          string.pointer ++,                                                    \
          1) :                                                                  \
         (COPY(emitter->buffer,string),                                         \
          emitter->column = 0,                                                  \
          emitter->line ++,                                                     \
          1)))
```

7.33.2 Function Documentation

7.33.2.1 static int yaml_emitter_analyze_anchor (yaml_emitter_t * *emitter,* yaml_char_t * *anchor,* int *alias*) [static]

7.33.2.2 static int yaml_emitter_analyze_event (yaml_emitter_t * *emitter,* yaml_event_t * *event*) [static]

7.33.2.3 static int yaml_emitter_analyze_scalar (yaml_emitter_t * *emitter,* yaml_char_t * *value,* size_t *length*) [static]

7.33.2.4 static int yaml_emitter_analyze_tag (yaml_emitter_t * *emitter,* yaml_char_t * *tag*) [static]

7.33.2.5 static int yaml_emitter_analyze_tag_directive (yaml_emitter_t * *emitter,* yaml_tag_directive_t *tag_directive*) [static]

7.33.2.6 static int yaml_emitter_analyze_version_directive (yaml_emitter_t * *emitter,* yaml_version_directive_t *version_directive*) [static]

7.33.2.7 static int yaml_emitter_append_tag_directive (yaml_emitter_t * *emitter,* yaml_tag_directive_t *value,* int *allow_duplicates*) [static]

7.33.2.8 static int yaml_emitter_check_empty_document (yaml_emitter_t * *emitter*) [static]

7.33.2.9 static int yaml_emitter_check_empty_mapping (yaml_emitter_t * *emitter*) [static]

7.33.2.10 static int yaml_emitter_check_empty_sequence (yaml_emitter_t * *emitter*) [static]

7.33.2.11 static int yaml_emitter_check_simple_key (yaml_emitter_t * *emitter*) [static]

7.33.2.12 static int yaml_emitter_emit_alias (yaml_emitter_t * *emitter,* yaml_event_t * *event*) [static]

7.33.2.13 static int yaml_emitter_emit_block_mapping_key (yaml_emitter_t * *emitter,* yaml_event_t * *event,* int *first*) [static]

7.33.2.14 static int yaml_emitter_emit_block_mapping_value (yaml_emitter_t * *emitter,* yaml_event_t * *event,* int *simple*) [static]

7.33.2.15 static int yaml_emitter_emit_block_sequence_item (yaml_emitter_t * *emitter,* yaml_event_t * *event,* int *first*) [static]

7.33.2.16 static int yaml_emitter_emit_document_content (yaml_emitter_t * *emitter,* yaml_event_t * *event*) [static]

7.33.2.17 static int yaml_emitter_emit_document_end (yaml_emitter_t * *emitter,* yaml_event_t * *event*) [static]

7.33.2.18 static int yaml_emitter_emit_document_start (yaml_emitter_t * *emitter,* yaml_event_t * *event,* int *first*) [static]

7.33.2.19 static int yaml_emitter_emit_flow_mapping_key (yaml_emitter_t * *emitter,* yaml_event_t * *event,* int *first*) [static]

7.33.2.20 static int yaml_emitter_emit_flow_mapping_value (yaml_emitter_t * *emitter,* yaml_event_t * *event,* int *simple*) [static]

7.33.2.21 static int yaml_emitter_emit_flow_sequence_item (yaml_emitter_t * *emitter,* yaml_event_t * *event,* int *first*) [static]

7.33.2.22 static int yaml_emitter_emit_mapping_start (yaml_emitter_t * *emitter,* yaml_event_t * *event*) [static]

7.33.2.23 static int yaml_emitter_emit_node (yaml_emitter_t * *emitter,* yaml_event_t * *event,* int *root,* int *sequence,* int *mapping,* int *simple_key*) [static]

7.33.2.24 static int yaml_emitter_emit_scalar (yaml_emitter_t * *emitter,* yaml_event_t * *event*) [static]

7.33.2.25 static int yaml_emitter_emit_sequence_start (yaml_emitter_t * *emitter,* yaml_event_t * *event*) [static]

7.33.2.26 static int yaml_emitter_emit_stream_start (yaml_emitter_t * *emitter,* yaml_event_t * *event*) [static]

7.33.2.27 static int yaml_emitter_increase_indent (yaml_emitter_t * *emitter,* int *flow,* int *indentless*) [static]

7.33.2.28 static int yaml_emitter_need_more_events (yaml_emitter_t * *emitter*) [static]

7.33.2.29 static int yaml_emitter_process_anchor (yaml_emitter_t * *emitter*) [static]

7.33.2.30 static int yaml_emitter_process_scalar (yaml_emitter_t * *emitter*) [static]

7.33.2.31 static int yaml_emitter_process_tag (yaml_emitter_t * *emitter*) [static]

7.33.2.32 static int yaml_emitter_select_scalar_style (yaml_emitter_t * *emitter,* yaml_event_t * *event*) [static]

7.33.2.33 static int yaml_emitter_set_emitter_error (yaml_emitter_t * *emitter,* const char * *problem*) [static]

7.33.2.34 static int yaml_emitter_state_machine (yaml_emitter_t * *emitter,* yaml_event_t * *event*) [static]

7.33.2.35 static int yaml_emitter_write_anchor (yaml_emitter_t * *emitter,* yaml_char_t * *value,* size_t *length*) [static]

7.33.2.36 static int yaml_emitter_write_block_scalar_hints (yaml_emitter_t * *emitter,* yaml_string_t *string*) [static]

7.33.2.37 static int yaml_emitter_write_bom (yaml_emitter_t * *emitter*) [static]

7.33.2.38 static int yaml_emitter_write_double_quoted_scalar (yaml_emitter_t * *emitter,* yaml_char_t * *value,* size_t *length,* int *allow_breaks*) [static]

7.33.2.39 static int yaml_emitter_write_folded_scalar (yaml_emitter_t * *emitter,* yaml_char_t * *value,* size_t *length*) [static]

7.33.2.40 static int yaml_emitter_write_indent (yaml_emitter_t * *emitter*) [static]

7.33.2.41 static int yaml_emitter_write_indicator (yaml_emitter_t * *emitter,* char * *indicator,* int *need_whitespace,* int *is_whitespace,* int *is_indention*) [static]

7.33.2.42 static int yaml_emitter_write_literal_scalar (yaml_emitter_t * *emitter,* yaml_char_t * *value,* size_t *length*) [static]

7.33.2.43 static int yaml_emitter_write_plain_scalar (yaml_emitter_t * *emitter,* yaml_char_t * *value,* size_t *length,* int *allow_breaks*) [static]

7.33.2.44 static int yaml_emitter_write_single_quoted_scalar (yaml_emitter_t * *emitter,* yaml_char_t * *value,* size_t *length,* int *allow_breaks*) [static]

7.33.2.45 static int yaml_emitter_write_tag_content (yaml_emitter_t * *emitter,* yaml_char_t * *value,* size_t *length,* int *need_whitespace*) [static]

7.33.2.46 static int yaml_emitter_write_tag_handle (yaml_emitter_t * *emitter,* yaml_char_t * *value,* size_t *length*) [static]

7.34 /Users/aladshaw3/projects/ecosystem/src/error.cpp File Reference

```
#include "error.h"
```

Functions

- void error (int flag)

7.34.1 Function Documentation

7.34.1.1 void error (int *flag*)

7.35 /Users/aladshaw3/projects/ecosystem/src/finch.cpp File Reference

```
#include "finch.h"
```

Functions

- double max (std::vector< double > &values)
- double min (std::vector< double > &values)
- double minmod (std::vector< double > &values)
- int uTotal (FINCH_DATA *dat)
- int uAverage (FINCH_DATA *dat)
- int check_Mass (FINCH_DATA *dat)
- int l_direct (FINCH_DATA *dat)
- int lark_picard_step (const Matrix< double > &x, Matrix< double > &G, const void *data)
- int nl_picard (FINCH_DATA *dat)
- int setup_FINCH_DATA (int(*user_callroutine)(const void *user_data), int(*user_setic)(const void *user_data), int(*user_timestep)(const void *user_data), int(*user_preprocess)(const void *user_data), int(*user_solve)(const void *user_data), int(*user_setparams)(const void *user_data), int(*user_discretize)(const void *user_data), int(*user_bcs)(const void *user_data), int(*user_res)(const Matrix< double > &x, Matrix< double > &res, const void *user_data), int(*user_precon)(const Matrix< double > &b, Matrix< double > &p, const void *user_data), int(*user_postprocess)(const void *user_data), int(*user_reset)(const void *user_data), FINCH_DATA *dat, const void *param_data)
- void print2file_dim_header (FILE *Output, FINCH_DATA *dat)
- void print2file_time_header (FILE *Output, FINCH_DATA *dat)
- void print2file_result_old (FILE *Output, FINCH_DATA *dat)
- void print2file_result_new (FILE *Output, FINCH_DATA *dat)
- void print2file_newline (FILE *Output, FINCH_DATA *dat)
- void print2file_tab (FILE *Output, FINCH_DATA *dat)
- int default_execution (const void *user_data)
- int default_ic (const void *user_data)
- int default_timestep (const void *user_data)
- int default_preprocess (const void *user_data)
- int default_solve (const void *user_data)
- int default_params (const void *user_data)
- int minmod_discretization (const void *user_data)
- int vanAlbada_discretization (const void *user_data)
- int ospre_discretization (const void *user_data)
- int default_bcs (const void *user_data)
- int default_res (const Matrix< double > &x, Matrix< double > &res, const void *user_data)
- int default_precon (const Matrix< double > &b, Matrix< double > &p, const void *user_data)
- int default_postprocess (const void *user_data)
- int default_reset (const void *user_data)
- int buckley_leverett_ic (const void *user_data)
- int buckley_leverett_params (const void *user_data)
- int burgers_ic (const void *user_data)
- int burgers_params (const void *user_data)
- int burgers_bcs (const void *user_data)
- int FINCH_TESTS ()

7.35.1 Function Documentation

7.35.1.1 int buckley_leverett_ic (const void * *user_data*)

7.35.1.2 int buckley_leverett_params (const void * *user_data*)

7.35.1.3 int burgers_bcs (const void * *user_data*)

7.35.1.4 int burgers_ic (const void * *user_data*)

7.35.1.5 int burgers_params (const void * *user_data*)

7.35.1.6 int check_Mass (**FINCH_DATA** * *dat*)

7.35.1.7 int default_bcs (const void * *user_data*)

7.35.1.8 int default_execution (const void * *user_data*)

7.35.1.9 int default_ic (const void * *user_data*)

7.35.1.10 int default_params (const void * *user_data*)

7.35.1.11 int default_postprocess (const void * *user_data*)

7.35.1.12 int default_precon (const **Matrix**< double > & *b,* **Matrix**< double > & *p,* const void * *user_data*)

7.35.1.13 int default_preprocess (const void * *user_data*)

7.35.1.14 int default_res (const **Matrix**< double > & *x,* **Matrix**< double > & *res,* const void * *user_data*)

7.35.1.15 int default_reset (const void * *user_data*)

7.35.1.16 int default_solve (const void * *user_data*)

7.35.1.17 int default_timestep (const void * *user_data*)

7.35.1.18 int FINCH_TESTS ( )

7.35.1.19 int l_direct (**FINCH_DATA** * *dat*)

7.35.1.20 int lark_picard_step (const **Matrix**< double > & *x,* **Matrix**< double > & *G,* const void * *data*)

7.35.1.21 double max (std::vector< double > & *values*)

7.35.1.22 double min (std::vector< double > & *values*)

7.35.1.23 double minmod (std::vector< double > & *values*)

7.35.1.24 int minmod_discretization (const void * *user_data*)

7.35.1.25 int nl_picard (**FINCH_DATA** * *dat*)

7.35.1.26 int ospre_discretization (const void * *user_data*)

7.35.1.27 void print2file_dim_header (FILE * *Output,* **FINCH_DATA** * *dat*)

7.35.1.28 void print2file_newline (FILE * *Output,* **FINCH_DATA** * *dat*)

7.35.1.29 void print2file_result_new (FILE * *Output,* **FINCH_DATA** * *dat*)

7.35.1.30 void print2file_result_old (FILE * *Output,* **FINCH_DATA** * *dat*)

7.35.1.31 void print2file_tab (FILE * *Output,* **FINCH_DATA** * *dat*)

7.35.1.32 void print2file_time_header (FILE * *Output,* **FINCH_DATA** * *dat*)

7.35.1.33 int setup_FINCH_DATA (int(*)(const void *user_data) *user_callroutine,* int(*)(const void *user_data) *user_setic,* int(*)(const void *user_data) *user_timestep,* int(*)(const void *user_data) *user_preprocess,* int(*)(const void *user_data) *user_solve,* int(*)(const void *user_data) *user_setparams,* int(*)(const void *user_data) *user_discretize,* int(*)(const void *user_data) *user_bcs,* int(*)(const Matrix< double > &x, Matrix< double > &res, const void *user_data) *user_res,* int(*)(const Matrix< double > &b, Matrix< double > &p, const void *user_data) *user_precon,* int(*)(const void *user_data) *user_postprocess,* int(*)(const void *user_data) *user_reset,* FINCH_DATA * *dat,* const void * *param_data*)

7.35.1.34 int uAverage (FINCH_DATA * *dat*)

7.35.1.35 int uTotal (FINCH_DATA * *dat*)

7.35.1.36 int vanAlbada_discretization (const void * *user_data*)

7.36 /Users/aladshaw3/projects/ecosystem/src/gsta_opt.cpp File Reference

```
#include "gsta_opt.h"
```

Functions

- int roundIt (double d)
- int twoFifths (int m)
- int orderMag (double x)
- int minValue (std::vector< int > array)
- int minIndex (std::vector< double > array)
- int avgPar (std::vector< int > array)
- double avgValue (std::vector< double > array)
- double weightedAvg (double *enorm, double *x, int n)
- double rSq (double *x, double *y, double slope, double vint, int m_dat)
- bool isSmooth (double *par, void *data)
- void orthoLinReg (double *x, double *y, double *par, int m_dat, int n_par)
- void eduGuess (double *P, double *q, double *par, int k, int m_dat, void *data)
- double gstaFunc (double p, const double *K, double qmax, int n_par)
- double gstaObjFunc (double *t, double *y, double *par, int m_dat, void *data)
- void eval_GSTA (const double *par, int m_dat, const void *data, double *fvec, int *info)
- int gsta_optimize (const char *fileName)

7.36.1 Function Documentation

7.36.1.1 int avgPar (std::vector< int > *array*)

7.36.1.2 double avgValue (std::vector< double > *array*)

7.36.1.3 void eduGuess (double * *P,* double * *q,* double * *par,* int *k,* int *m_dat,* void * *data*)

7.36.1.4 void eval_GSTA (const double * *par,* int *m_dat,* const void * *data,* double * *fvec,* int * *info*)

7.36.1.5 int gsta_optimize (const char * *fileName*)

7.36.1.6 double gstaFunc (double *p,* const double * *K,* double *qmax,* int *n_par*)

7.36.1.7 double gstaObjFunc (double * *t,* double * *y,* double * *par,* int *m_dat,* void * *data*)

7.36.1.8 bool isSmooth (double * *par,* void * *data*)

7.36.1.9 int minIndex (std::vector< double > *array*)

7.36.1.10 int minValue (std::vector< int > *array*)

7.36.1.11 int orderMag (double *x*)

7.36.1.12 void orthoLinReg (double * *x,* double * *y,* double * *par,* int *m_dat,* int *n_par*)

7.36.1.13 int roundIt (double *d*)

7.36.1.14 double rSq (double * *x,* double * *y,* double *slope,* double *vint,* int *m_dat*)

7.36.1.15 int twoFifths (int *m*)

7.36.1.16 double weightedAvg (double * *enorm,* double * *x,* int *n*)

7.37 /Users/aladshaw3/projects/ecosystem/src/lark.cpp File Reference

```
#include "lark.h"
```

Functions

- int matvec_ex01 (const Matrix< double > &v, Matrix< double > &w, const void *data)
- int precon_ex01 (const Matrix< double > &b, Matrix< double > &p, const void *data)
- int matvec_ex02 (const Matrix< double > &v, Matrix< double > &w, const void *data)
- int matvec_ex04 (const Matrix< double > &v, Matrix< double > &w, const void *data)
- int precon_ex04 (const Matrix< double > &b, Matrix< double > &p, const void *data)
- int evalx_ex09 (const Matrix< double > &x, Matrix< double > &G, const void *data)
- int funeval_ex09 (const Matrix< double > &x, Matrix< double > &F, const void *data)
- int funeval_ex10 (const Matrix< double > &x, Matrix< double > &F, const void *data)
- int precon_ex10 (const Matrix< double > &r, Matrix< double > &p, const void *data)
- int matvec_ex15 (const Matrix< double > &v, Matrix< double > &w, const void *data)
- int precon_ex15 (const Matrix< double > &w, Matrix< double > &p, const void *data)
- int update_arnoldi_solution (Matrix< double > &x, Matrix< double > &x0, ARNOLDI_DATA *arnoldi_dat)
- int arnoldi (int(*matvec)(const Matrix< double > &v, Matrix< double > &w, const void *data), int(*precon)(const Matrix< double > &b, Matrix< double > &p, const void *data), Matrix< double > &r0, ARNOLDI_DATA *arnoldi_dat, const void *matvec_data, const void *precon_data)
- int gmresLeftPreconditioned (int(*matvec)(const Matrix< double > &v, Matrix< double > &w, const void *data), int(*precon)(const Matrix< double > &b, Matrix< double > &P, const void *data), Matrix< double > &b, GMRESLP_DATA *gmreslp_dat, const void *matvec_data, const void *precon_data)
- int fom (int(*matvec)(const Matrix< double > &v, Matrix< double > &w, const void *data), int(*precon)(const Matrix< double > &b, Matrix< double > &P, const void *data), Matrix< double > &b, GMRESLP_DATA *gmreslp_dat, const void *matvec_data, const void *precon_data)
- int gmresRightPreconditioned (int(*matvec)(const Matrix< double > &v, Matrix< double > &w, const void *data), int(*precon)(const Matrix< double > &b, Matrix< double > &p, const void *data), Matrix< double > &b, GMRESRP_DATA *gmresrp_dat, const void *matvec_data, const void *precon_data)
- int pcg (int(*matvec)(const Matrix< double > &p, Matrix< double > &Ap, const void *data), int(*precon)(const Matrix< double > &r, Matrix< double > &z, const void *data), Matrix< double > &b, PCG_DATA *pcg_dat, const void *matvec_data, const void *precon_data)
- int bicgstab (int(*matvec)(const Matrix< double > &p, Matrix< double > &Ap, const void *data), int(*precon)(const Matrix< double > &r, Matrix< double > &z, const void *data), Matrix< double > &b, BiCGSTAB_DATA *bicg_dat, const void *matvec_data, const void *precon_data)

- int cgs (int(∗matvec)(const Matrix< double > &p, Matrix< double > &Ap, const void ∗data), int(∗precon)(const Matrix< double > &r, Matrix< double > &z, const void ∗data), Matrix< double > &b, CGS_DATA ∗cgs_dat, const void ∗matvec_data, const void ∗precon_data)
- int operatorTranspose (int(∗matvec)(const Matrix< double > &v, Matrix< double > &Av, const void ∗data), Matrix< double > &r, Matrix< double > &u, OPTRANS_DATA ∗transpose_dat, const void ∗matvec_data)
- int gcr (int(∗matvec)(const Matrix< double > &x, Matrix< double > &Ax, const void ∗data), int(∗precon)(const Matrix< double > &r, Matrix< double > &Mr, const void ∗data), Matrix< double > &b, GCR_DATA ∗gcr_dat, const void ∗matvec_data, const void ∗precon_data)
- int gmresPreconditioner (const Matrix< double > &r, Matrix< double > &Mr, const void ∗data)
- int gmresr (int(∗matvec)(const Matrix< double > &x, Matrix< double > &Ax, const void ∗data), int(∗terminal_precon)(const Matrix< double > &r, Matrix< double > &Mr, const void ∗data), Matrix< double > &b, GMRESR_DATA ∗gmresr_dat, const void ∗matvec_data, const void ∗term_precon_data)
- int picard (int(∗res)(const Matrix< double > &x, Matrix< double > &r, const void ∗data), int(∗evalx)(const Matrix< double > &x0, Matrix< double > &x, const void ∗data), Matrix< double > &x, PICARD_DATA ∗picard_dat, const void ∗res_data, const void ∗evalx_data)
- int jacvec (const Matrix< double > &v, Matrix< double > &Jv, const void ∗data)
- int backtrackLineSearch (int(∗feval)(const Matrix< double > &x, Matrix< double > &F, const void ∗data), Matrix< double > &Fkp1, Matrix< double > &xkp1, Matrix< double > &pk, double normFk, BACKTRACK_DATA ∗backtrack_dat, const void ∗feval_data)
- int pjfnk (int(∗res)(const Matrix< double > &x, Matrix< double > &F, const void ∗data), int(∗precon)(const Matrix< double > &r, Matrix< double > &p, const void ∗data), Matrix< double > &x, PJFNK_DATA ∗pjfnk_dat, const void ∗res_data, const void ∗precon_data)
- int NumericalJacobian (int(∗Func)(const Matrix< double > &x, Matrix< double > &F, const void ∗user_data), const Matrix< double > &x, Matrix< double > &J, int Nx, int Nf, NUM_JAC_DATA ∗jac_dat, const void ∗user_data)
- int LARK_TESTS ()

7.37.1 Function Documentation

7.37.1.1 int arnoldi (int(∗)(const Matrix< double > &v, Matrix< double > &w, const void ∗data) *matvec,* int(∗)(const Matrix< double > &b, Matrix< double > &p, const void ∗data) *precon,* Matrix< double > & *r0,* ARNOLDI_DATA ∗ *arnoldi_dat,* const void ∗ *matvec_data,* const void ∗ *precon_data*)

7.37.1.2 int backtrackLineSearch (int(∗)(const Matrix< double > &x, Matrix< double > &F, const void ∗data) *feval,* Matrix< double > & *Fkp1,* Matrix< double > & *xkp1,* Matrix< double > & *pk,* double *normFk,* BACKTRACK_DATA ∗ *backtrack_dat,* const void ∗ *feval_data*)

7.37.1.3 int bicgstab (int(∗)(const Matrix< double > &p, Matrix< double > &Ap, const void ∗data) *matvec,* int(∗)(const Matrix< double > &r, Matrix< double > &z, const void ∗data) *precon,* Matrix< double > & *b,* BiCGSTAB_DATA ∗ *bicg_dat,* const void ∗ *matvec_data,* const void ∗ *precon_data*)

7.37.1.4 int cgs (int(∗)(const Matrix< double > &p, Matrix< double > &Ap, const void ∗data) *matvec,* int(∗)(const Matrix< double > &r, Matrix< double > &z, const void ∗data) *precon,* Matrix< double > & *b,* CGS_DATA ∗ *cgs_dat,* const void ∗ *matvec_data,* const void ∗ *precon_data*)

7.37.1.5 int evalx_ex09 (const Matrix< double > & *x,* Matrix< double > & *G,* const void ∗ *data*)

7.37.1.6 int fom (int(∗)(const Matrix< double > &v, Matrix< double > &w, const void ∗data) *matvec,* int(∗)(const Matrix< double > &b, Matrix< double > &P, const void ∗data) *precon,* Matrix< double > & *b,* GMRESLP_DATA ∗ *gmreslp_dat,* const void ∗ *matvec_data,* const void ∗ *precon_data*)

7.37.1.7 int funeval_ex09 (const Matrix< double > & *x,* Matrix< double > & *F,* const void ∗ *data*)

7.37.1.8 int funeval_ex10 (const Matrix< double > & *x,* Matrix< double > & *F,* const void ∗ *data*)

7.37.1.9 int gcr (int(∗)(const Matrix< double > &x, Matrix< double > &Ax, const void ∗data) *matvec,* int(∗)(const Matrix< double > &r, Matrix< double > &Mr, const void ∗data) *precon,* Matrix< double > & *b,* GCR_DATA ∗ *gcr_dat,* const void ∗ *matvec_data,* const void ∗ *precon_data*)

7.37.1.10 int gmresLeftPreconditioned (int(∗)(const Matrix< double > &v, Matrix< double > &w, const void ∗data) *matvec,* int(∗)(const Matrix< double > &b, Matrix< double > &P, const void ∗data) *precon,* Matrix< double > & *b,* GMRESLP_DATA ∗ *gmreslp_dat,* const void ∗ *matvec_data,* const void ∗ *precon_data*)

7.37.1.11 int gmresPreconditioner (const Matrix< double > & *r,* Matrix< double > & *Mr,* const void ∗ *data*)

7.37.1.12 int gmresr (int(∗)(const Matrix< double > &x, Matrix< double > &Ax, const void ∗data) *matvec,* int(∗)(const Matrix< double > &r, Matrix< double > &Mr, const void ∗data) *terminal_precon,* Matrix< double > & *b,* GMRESR_DATA ∗ *gmresr_dat,* const void ∗ *matvec_data,* const void ∗ *term_precon_data*)

7.37.1.13 int gmresRightPreconditioned (int(∗)(const Matrix< double > &v, Matrix< double > &w, const void ∗data) *matvec,* int(∗)(const Matrix< double > &b, Matrix< double > &p, const void ∗data) *precon,* Matrix< double > & *b,* GMRESRP_DATA ∗ *gmresrp_dat,* const void ∗ *matvec_data,* const void ∗ *precon_data*)

7.37.1.14 int jacvec (const Matrix< double > & *v,* Matrix< double > & *Jv,* const void ∗ *data*)

7.37.1.15 int LARK_TESTS ( )

7.37.1.16 int matvec_ex01 (const Matrix< double > & *v,* Matrix< double > & *w,* const void ∗ *data*)

7.37.1.17 int matvec_ex02 (const Matrix< double > & *v,* Matrix< double > & *w,* const void ∗ *data*)

7.37.1.18 int matvec_ex04 (const Matrix< double > & *v,* Matrix< double > & *w,* const void ∗ *data*)

7.37.1.19 int matvec_ex15 (const Matrix< double > & *v,* Matrix< double > & *w,* const void ∗ *data*)

7.37.1.20 int NumericalJacobian (int(∗)(const Matrix< double > &x, Matrix< double > &F, const void ∗user_data) *Func,* const Matrix< double > & *x,* Matrix< double > & *J,* int *Nx,* int *Nf,* NUM_JAC_DATA ∗ *jac_dat,* const void ∗ *user_data*)

7.37.1.21 int operatorTranspose (int(∗)(const Matrix< double > &v, Matrix< double > &Av, const void ∗data) *matvec,* Matrix< double > & *r,* Matrix< double > & *u,* OPTRANS_DATA ∗ *transpose_dat,* const void ∗ *matvec_data*)

7.37.1.22 int pcg (int(∗)(const Matrix< double > &p, Matrix< double > &Ap, const void ∗data) *matvec,* int(∗)(const Matrix< double > &r, Matrix< double > &z, const void ∗data) *precon,* Matrix< double > & *b,* PCG_DATA ∗ *pcg_dat,* const void ∗ *matvec_data,* const void ∗ *precon_data*)

7.37.1.23 int picard (int(∗)(const Matrix< double > &x, Matrix< double > &r, const void ∗data) *res,* int(∗)(const Matrix< double > &x0, Matrix< double > &x, const void ∗data) *evalx,* Matrix< double > & *x,* PICARD_DATA ∗ *picard_dat,* const void ∗ *res_data,* const void ∗ *evalx_data*)

7.37.1.24 int pjfnk (int(∗)(const Matrix< double > &x, Matrix< double > &F, const void ∗data) *res,* int(∗)(const Matrix< double > &r, Matrix< double > &p, const void ∗data) *precon,* Matrix< double > & *x,* PJFNK_DATA ∗ *pjfnk_dat,* const void ∗ *res_data,* const void ∗ *precon_data*)

7.37.1.25 int precon_ex01 (const Matrix< double > & *b,* Matrix< double > & *p,* const void ∗ *data*)

7.37.1.26 int precon_ex04 (const Matrix< double > & *b,* Matrix< double > & *p,* const void ∗ *data*)

7.37.1.27 int precon_ex10 (const Matrix< double > & *r,* Matrix< double > & *p,* const void ∗ *data*)

7.37.1.28 int precon_ex15 (const Matrix< double > & *w,* Matrix< double > & *p,* const void ∗ *data*)

7.37.1.29 int update_arnoldi_solution (Matrix< double > & *x,* Matrix< double > & *x0,* ARNOLDI_DATA * *arnoldi_dat*)

7.38 /Users/aladshaw3/projects/ecosystem/src/lmcurve.c File Reference

```
#include "lmmin.h"
```

Classes

- struct lmcurve_data_struct

Functions

- void lmcurve_evaluate (const double *par, int m_dat, const void *data, double *fvec, int *info)
- void lmcurve_fit (int n_par, double *par, int m_dat, const double *t, const double *y, double(*f)(double t, const double *par), const lm_control_struct *control, lm_status_struct *status)

7.38.1 Function Documentation

7.38.1.1 void lmcurve_evaluate (const double * *par,* int *m_dat,* const void * *data,* double * *fvec,* int * *info*)

7.38.1.2 void lmcurve_fit (int *n_par,* double * *par,* int *m_dat,* const double * *t,* const double * *y,* double(*)(double t, const double *par) *f,* const lm_control_struct * *control,* lm_status_struct * *status*)

7.39 /Users/aladshaw3/projects/ecosystem/src/lmmin.c File Reference

```
#include <stdlib.h>
#include <stdio.h>
#include <math.h>
#include <float.h>
#include "lmmin.h"
```

Macros

- #define LM_MACHEP DBL_EPSILON
- #define LM_DWARF DBL_MIN
- #define LM_SQRT_DWARF sqrt(DBL_MIN)
- #define LM_SQRT_GIANT sqrt(DBL_MAX)
- #define LM_USERTOL 30*LM_MACHEP
- #define MIN(a, b) (((a)<=(b)) ? (a) : (b))
- #define MAX(a, b) (((a)>=(b)) ? (a) : (b))
- #define SQR(x) (x)*(x)

Functions

- void lm_printout_std (int n_par, const double *par, int m_dat, const void *data, const double *fvec, int printflags, int iflag, int iter, int nfev)
- void lmmin (int n_par, double *par, int m_dat, const void *data, void(*evaluate)(const double *par, int m_dat, const void *data, double *fvec, int *info), const lm_control_struct *control, lm_status_struct *status, void(*printout)(int n_par, const double *par, int m_dat, const void *data, const double *fvec, int printflags, int iflag, int iter, int nfev))

- void lm_lmpar (int n, double *r, int ldr, int *ipvt, double *diag, double *qtb, double delta, double *par, double *x, double *sdiag, double *aux, double *xdi)
- void lm_qrfac (int m, int n, double *a, int pivot, int *ipvt, double *rdiag, double *acnorm, double *wa)
- void lm_qrsolv (int n, double *r, int ldr, int *ipvt, double *diag, double *qtb, double *x, double *sdiag, double *wa)
- void lm_lmdif (int m, int n, double *x, double *fvec, double ftol, double xtol, double gtol, int maxfev, double epsfcn, double *diag, int mode, double factor, int *info, int *nfev, double *fjac, int *ipvt, double *qtf, double *wa1, double *wa2, double *wa3, double *wa4, void(*evaluate)(const double *par, int m_dat, const void *data, double *fvec, int *info), void(*printout)(int n_par, const double *par, int m_dat, const void *data, const double *fvec, int printflags, int iflag, int iter, int nfev), int printflags, const void *data)
- double lm_enorm (int n, const double *x)

Variables

- const lm_control_struct lm_control_double
- const lm_control_struct lm_control_float
- const char * lm_infmsg []
- const char * lm_shortmsg []

7.39.1 Macro Definition Documentation

7.39.1.1 #define LM_DWARF DBL_MIN

7.39.1.2 #define LM_MACHEP DBL_EPSILON

7.39.1.3 #define LM_SQRT_DWARF sqrt(DBL_MIN)

7.39.1.4 #define LM_SQRT_GIANT sqrt(DBL_MAX)

7.39.1.5 #define LM_USERTOL 30*LM_MACHEP

7.39.1.6 #define MAX(*a*, *b*) (((a)>=(b)) ? (a) : (b))

7.39.1.7 #define MIN(*a*, *b*) (((a)<=(b)) ? (a) : (b))

7.39.1.8 #define SQR(*x*) (x)*(x)

7.39.2 Function Documentation

7.39.2.1 double lm_enorm (int *n*, const double * *x*)

sum squares.

calculation of norm.

7.39.2.2 void lm_lmdif (int *m*, int *n*, double * *x*, double * *fvec*, double *ftol*, double *xtol*, double *gtol*, int *maxfev*, double *epsfcn*, double * *diag*, int *mode*, double *factor*, int * *info*, int * *nfev*, double * *fjac*, int * *ipvt*, double * *qtf*, double * *wa1*, double * *wa2*, double * *wa3*, double * *wa4*, void(*)(const double *par, int m_dat, const void *data, double *fvec, int *info) *evaluate*, void(*)(int n_par, const double *par, int m_dat, const void *data, const double *fvec, int printflags, int iflag, int iter, int nfev) *printout*, int *printflags*, const void * *data*)

Legacy low-level interface.

7.39.2.3 void lm_lmpar (int *n,* double * *r,* int *ldr,* int * *ipvt,* double * *diag,* double * *qtb,* double *delta,* double * *par,* double * *x,* double * *sdiag,* double * *aux,* double * *xdi*)

evaluate the function at the current value of par.

if the function is small enough, accept the current value of par. Also test for the exceptional cases where parl is zero or the number of iterations has reached 10.

compute the Newton correction.

depending on the sign of the function, update parl or paru.

compute an improved estimate for par.

7.39.2.4 void lm_printout_std (int *n_par,* const double * *par,* int *m_dat,* const void * *data,* const double * *fvec,* int *printflags,* int *iflag,* int *iter,* int *nfev*)

7.39.2.5 void lm_qrfac (int *m,* int *n,* double * *a,* int *pivot,* int * *ipvt,* double * *rdiag,* double * *acnorm,* double * *wa*)

bring the column of largest norm into the pivot position.

compute the Householder transformation to reduce the j-th column of a to a multiple of the j-th unit vector.

apply the transformation to the remaining columns and update the norms.

7.39.2.6 void lm_qrsolv (int *n,* double * *r,* int *ldr,* int * *ipvt,* double * *diag,* double * *qtb,* double * *x,* double * *sdiag,* double * *wa*)

determine a Givens rotation which eliminates the appropriate element in the current row of d.

compute the modified diagonal element of r and the modified element of ((q transpose)*b,0).

accumulate the tranformation in the row of s.

store the diagonal element of s and restore the corresponding diagonal element of r.

7.39.2.7 void lmmin (int *n_par,* double * *par,* int *m_dat,* const void * *data,* void(*)(const double *par, int m_dat, const void *data, double *fvec, int *info) *evaluate,* const lm_control_struct * *control,* lm_status_struct * *status,* void(*)(int n_par, const double *par, int m_dat, const void *data, const double *fvec, int printflags, int iflag, int iter, int nfev) *printout*)

7.39.3 Variable Documentation

7.39.3.1 const lm_control_struct lm_control_double

Initial value:

```
= {
    LM_USERTOL, LM_USERTOL, LM_USERTOL, LM_USERTOL, 100., 100, 1, 0
      }
```

7.39.3.2 const lm_control_struct lm_control_float

Initial value:

```
= {
    1.e-7, 1.e-7, 1.e-7, 1.e-7, 100., 100, 0, 0 }
```

7.39.3.3 const char* lm_infmsg[]

Initial value:

```
= {
    "success (sum of squares below underflow limit)",
    "success (the relative error in the sum of squares is at most tol)",
    "success (the relative error between x and the solution is at most tol)",
    "success (both errors are at most tol)",
    "trapped by degeneracy (increasing epsilon might help)",
    "timeout (number of calls to fcn has reached maxcall*(n+1))",
    "failure (ftol<tol: cannot reduce sum of squares any further)",
    "failure (xtol<tol: cannot improve approximate solution any further)",
    "failure (gtol<tol: cannot improve approximate solution any further)",
    "exception (not enough memory)",
    "fatal coding error (improper input parameters)",
    "exception (break requested within function evaluation)"
}
```

7.39.3.4 const char* lm_shortmsg[]

Initial value:

```
= {
    "success (0)",
    "success (f)",
    "success (p)",
    "success (f,p)",
    "degenerate",
    "call limit",
    "failed (f)",
    "failed (p)",
    "failed (o)",
    "no memory",
    "invalid input",
    "user break"
}
```

7.40 /Users/aladshaw3/projects/ecosystem/src/loader.c File Reference

```
#include "yaml_private.h"
```

Functions

- yaml_parser_load (yaml_parser_t *parser, yaml_document_t *document)
- static int yaml_parser_set_composer_error (yaml_parser_t *parser, const char *problem, yaml_mark_t problem_mark)
- static int yaml_parser_set_composer_error_context (yaml_parser_t *parser, const char *context, yaml_mark_t context_mark, const char *problem, yaml_mark_t problem_mark)
- static int yaml_parser_register_anchor (yaml_parser_t *parser, int index, yaml_char_t *anchor)
- static void yaml_parser_delete_aliases (yaml_parser_t *parser)
- static int yaml_parser_load_document (yaml_parser_t *parser, yaml_event_t *first_event)
- static int yaml_parser_load_node (yaml_parser_t *parser, yaml_event_t *first_event)
- static int yaml_parser_load_alias (yaml_parser_t *parser, yaml_event_t *first_event)
- static int yaml_parser_load_scalar (yaml_parser_t *parser, yaml_event_t *first_event)
- static int yaml_parser_load_sequence (yaml_parser_t *parser, yaml_event_t *first_event)
- static int yaml_parser_load_mapping (yaml_parser_t *parser, yaml_event_t *first_event)

7.40.1 Function Documentation

7.40.1.1 static void yaml_parser_delete_aliases (yaml_parser_t * *parser*) [static]

7.40.1.2 static int yaml_parser_load_alias (yaml_parser_t * *parser,* yaml_event_t * *first_event*) [static]

7.40.1.3 static int yaml_parser_load_document (yaml_parser_t * *parser,* yaml_event_t * *first_event*) [static]

7.40.1.4 static int yaml_parser_load_mapping (yaml_parser_t * *parser,* yaml_event_t * *first_event*) [static]

7.40.1.5 static int yaml_parser_load_node (yaml_parser_t * *parser,* yaml_event_t * *first_event*) [static]

7.40.1.6 static int yaml_parser_load_scalar (yaml_parser_t * *parser,* yaml_event_t * *first_event*) [static]

7.40.1.7 static int yaml_parser_load_sequence (yaml_parser_t * *parser,* yaml_event_t * *first_event*) [static]

7.40.1.8 static int yaml_parser_register_anchor (yaml_parser_t * *parser,* int *index,* yaml_char_t * *anchor*) [static]

7.40.1.9 static int yaml_parser_set_composer_error (yaml_parser_t * *parser,* const char * *problem,* yaml_mark_t *problem_mark*) [static]

7.40.1.10 static int yaml_parser_set_composer_error_context (yaml_parser_t * *parser,* const char * *context,* yaml_mark_t *context_mark,* const char * *problem,* yaml_mark_t *problem_mark*) [static]

7.41 /Users/aladshaw3/projects/ecosystem/src/macaw.cpp File Reference

```
#include "macaw.h"
```

Functions

- int MACAW_TESTS ()

7.41.1 Function Documentation

7.41.1.1 int MACAW_TESTS ( )

7.42 /Users/aladshaw3/projects/ecosystem/src/magpie.cpp File Reference

```
#include "magpie.h"
```

Functions

- double qo (double po, const void *data, int i)
- double dq_dp (double p, const void *data, int i)
- double q_p (double p, const void *data, int i)
- double PI (double po, const void *data, int i)
- double eMax (const void *data, int i)
- double Qst (double po, const void *data, int i)
- double Inact_mSPD (const double *par, const void *data, int i, volatile double PI)
- double grad_mSPD (const double *par, const void *data, int i)

- double qT (const double *par, const void *data)
- void initialGuess_mSPD (double *par, const void *data)
- void eval_po_PI (const double *par, int m_dat, const void *data, double *fvec, int *info)
- void eval_po_qo (const double *par, int m_dat, const void *data, double *fvec, int *info)
- void eval_po (const double *par, int m_dat, const void *data, double *fvec, int *info)
- void eval_eta (const double *par, int m_dat, const void *data, double *fvec, int *info)
- void eval_GPAST (const double *par, int m_dat, const void *data, double *fvec, int *info)
- int MAGPIE (const void *data)
- int MAGPIE_SCENARIOS (const char *inputFileName, const char *sceneFileName)

7.42.1 Function Documentation

7.42.1.1 double dq_dp (double *p*, const void * *data*, int *i*)

7.42.1.2 double eMax (const void * *data*, int *i*)

7.42.1.3 void eval_eta (const double * *par*, int *m_dat*, const void * *data*, double * *fvec*, int * *info*)

7.42.1.4 void eval_GPAST (const double * *par*, int *m_dat*, const void * *data*, double * *fvec*, int * *info*)

7.42.1.5 void eval_po (const double * *par*, int *m_dat*, const void * *data*, double * *fvec*, int * *info*)

7.42.1.6 void eval_po_PI (const double * *par*, int *m_dat*, const void * *data*, double * *fvec*, int * *info*)

7.42.1.7 void eval_po_qo (const double * *par*, int *m_dat*, const void * *data*, double * *fvec*, int * *info*)

7.42.1.8 double grad_mSPD (const double * *par*, const void * *data*, int *i*)

7.42.1.9 void initialGuess_mSPD (double * *par*, const void * *data*)

7.42.1.10 double Inact_mSPD (const double * *par*, const void * *data*, int *i*, volatile double *PI*)

7.42.1.11 int MAGPIE (const void * *data*)

7.42.1.12 int MAGPIE_SCENARIOS (const char * *inputFileName*, const char * *sceneFileName*)

7.42.1.13 double PI (double *po*, const void * *data*, int *i*)

7.42.1.14 double q_p (double *p*, const void * *data*, int *i*)

7.42.1.15 double qo (double *po*, const void * *data*, int *i*)

7.42.1.16 double Qst (double *po*, const void * *data*, int *i*)

7.42.1.17 double qT (const double * *par*, const void * *data*)

7.43 /Users/aladshaw3/projects/ecosystem/src/main.cpp File Reference

```
#include "ui.h"
```

Functions

- int main (int argc, const char *argv[])

7.43.1 Function Documentation

7.43.1.1 int main (int *argc,* const char * *argv[]*)

7.44 /Users/aladshaw3/projects/ecosystem/src/mola.cpp File Reference

```
#include "mola.h"
```

Functions

- int MOLA_TESTS ()

7.44.1 Function Documentation

7.44.1.1 int MOLA_TESTS ( )

7.45 /Users/aladshaw3/projects/ecosystem/src/monkfish.cpp File Reference

```
#include "monkfish.h"
```

Functions

- double default_porosity (int i, int l, const void *user_data)
- double default_density (int i, int l, const void *user_data)
- double default_interparticle_diffusion (int i, int l, const void *user_data)
- double default_monk_adsorption (int i, int l, const void *user_data)
- double default_monk_equilibrium (int i, int l, const void *user_data)
- double default_monkfish_retardation (int i, int l, const void *user_data)
- double default_exterior_concentration (int i, const void *user_data)
- double default_film_transfer (int i, const void *user_data)
- int MONKFISH_TESTS ()

7.45.1 Function Documentation

7.45.1.1 double default_density (int *i,* int *l,* const void * *user_data*)

7.45.1.2 double default_exterior_concentration (int *i,* const void * *user_data*)

7.45.1.3 double default_film_transfer (int *i,* const void * *user_data*)

7.45.1.4 double default_interparticle_diffusion (int *i,* int *l,* const void * *user_data*)

7.45.1.5 double default_monk_adsorption (int *i,* int *l,* const void * *user_data*)

7.45.1.6 double default_monk_equilibrium (int *i,* int *l,* const void * *user_data*)

7.45.1.7 double default_monkfish_retardation (int *i,* int *l,* const void * *user_data*)

7.45.1.8 double default_porosity (int *i,* int *l,* const void * *user_data*)

7.45.1.9 int MONKFISH_TESTS ( )

7.46 /Users/aladshaw3/projects/ecosystem/src/parser.c File Reference

```
#include "yaml_private.h"
```

Macros

- #define PEEK_TOKEN(parser)
- #define SKIP_TOKEN(parser)

Functions

- yaml_parser_parse (yaml_parser_t *parser, yaml_event_t *event)
- static int yaml_parser_set_parser_error (yaml_parser_t *parser, const char *problem, yaml_mark_t problem_mark)
- static int yaml_parser_set_parser_error_context (yaml_parser_t *parser, const char *context, yaml_mark_t context_mark, const char *problem, yaml_mark_t problem_mark)
- static int yaml_parser_state_machine (yaml_parser_t *parser, yaml_event_t *event)
- static int yaml_parser_parse_stream_start (yaml_parser_t *parser, yaml_event_t *event)
- static int yaml_parser_parse_document_start (yaml_parser_t *parser, yaml_event_t *event, int implicit)
- static int yaml_parser_parse_document_content (yaml_parser_t *parser, yaml_event_t *event)
- static int yaml_parser_parse_document_end (yaml_parser_t *parser, yaml_event_t *event)
- static int yaml_parser_parse_node (yaml_parser_t *parser, yaml_event_t *event, int block, int indentless_sequence)
- static int yaml_parser_parse_block_sequence_entry (yaml_parser_t *parser, yaml_event_t *event, int first)
- static int yaml_parser_parse_indentless_sequence_entry (yaml_parser_t *parser, yaml_event_t *event)
- static int yaml_parser_parse_block_mapping_key (yaml_parser_t *parser, yaml_event_t *event, int first)
- static int yaml_parser_parse_block_mapping_value (yaml_parser_t *parser, yaml_event_t *event)
- static int yaml_parser_parse_flow_sequence_entry (yaml_parser_t *parser, yaml_event_t *event, int first)
- static int yaml_parser_parse_flow_sequence_entry_mapping_key (yaml_parser_t *parser, yaml_event_t *event)
- static int yaml_parser_parse_flow_sequence_entry_mapping_value (yaml_parser_t *parser, yaml_event_t *event)
- static int yaml_parser_parse_flow_sequence_entry_mapping_end (yaml_parser_t *parser, yaml_event_t *event)
- static int yaml_parser_parse_flow_mapping_key (yaml_parser_t *parser, yaml_event_t *event, int first)
- static int yaml_parser_parse_flow_mapping_value (yaml_parser_t *parser, yaml_event_t *event, int empty)
- static int yaml_parser_process_empty_scalar (yaml_parser_t *parser, yaml_event_t *event, yaml_mark_t mark)
- static int yaml_parser_process_directives (yaml_parser_t *parser, yaml_version_directive_t **version_directive_ref, yaml_tag_directive_t **tag_directives_start_ref, yaml_tag_directive_t **tag_directives_end_ref)
- static int yaml_parser_append_tag_directive (yaml_parser_t *parser, yaml_tag_directive_t value, int allow_duplicates, yaml_mark_t mark)

7.46.1 Macro Definition Documentation

7.46.1.1 #define PEEK_TOKEN(*parser*)

Value:

```
((parser->token_available || yaml_parser_fetch_more_tokens(parser)) ?       \
        parser->tokens.head : NULL)
```

7.46.1.2 #define SKIP_TOKEN(*parser*)

Value:

```
(parser->token_available = 0,                                           \
     parser->tokens_parsed ++,                                              \
     parser->stream_end_produced =                                          \
        (parser->tokens.head->type == YAML_STREAM_END_TOKEN),               \
     parser->tokens.head ++)
```

7.46.2 Function Documentation

7.46.2.1 static int yaml_parser_append_tag_directive (yaml_parser_t * *parser*, yaml_tag_directive_t *value*, int *allow_duplicates*, yaml_mark_t *mark*) [static]

7.46.2.2 static int yaml_parser_parse_block_mapping_key (yaml_parser_t * *parser*, yaml_event_t * *event*, int *first*) [static]

7.46.2.3 static int yaml_parser_parse_block_mapping_value (yaml_parser_t * *parser*, yaml_event_t * *event*) [static]

7.46.2.4 static int yaml_parser_parse_block_sequence_entry (yaml_parser_t * *parser*, yaml_event_t * *event*, int *first*) [static]

7.46.2.5 static int yaml_parser_parse_document_content (yaml_parser_t * *parser*, yaml_event_t * *event*) [static]

7.46.2.6 static int yaml_parser_parse_document_end (yaml_parser_t * *parser*, yaml_event_t * *event*) [static]

7.46.2.7 static int yaml_parser_parse_document_start (yaml_parser_t * *parser*, yaml_event_t * *event*, int *implicit*) [static]

7.46.2.8 static int yaml_parser_parse_flow_mapping_key (yaml_parser_t * *parser*, yaml_event_t * *event*, int *first*) [static]

7.46.2.9 static int yaml_parser_parse_flow_mapping_value (yaml_parser_t * *parser*, yaml_event_t * *event*, int *empty*) [static]

7.46.2.10 static int yaml_parser_parse_flow_sequence_entry (yaml_parser_t * *parser*, yaml_event_t * *event*, int *first*) [static]

7.46.2.11 static int yaml_parser_parse_flow_sequence_entry_mapping_end (yaml_parser_t * *parser*, yaml_event_t * *event*) [static]

7.46.2.12 static int yaml_parser_parse_flow_sequence_entry_mapping_key (yaml_parser_t * *parser*, yaml_event_t * *event*) [static]

7.46.2.13 static int yaml_parser_parse_flow_sequence_entry_mapping_value (yaml_parser_t * *parser*, yaml_event_t * *event*) [static]

7.46.2.14 static int yaml_parser_parse_indentless_sequence_entry (yaml_parser_t * *parser*, yaml_event_t * *event*) [static]

7.46.2.15 static int yaml_parser_parse_node (yaml_parser_t * *parser*, yaml_event_t * *event*, int *block*, int *indentless_sequence*) [static]

7.46.2.16 static int yaml_parser_parse_stream_start (yaml_parser_t * *parser*, yaml_event_t * *event*) [static]

7.46.2.17 static int yaml_parser_process_directives (yaml_parser_t * *parser,* yaml_version_directive_t ** *version_directive_ref,* yaml_tag_directive_t ** *tag_directives_start_ref,* yaml_tag_directive_t ** *tag_directives_end_ref*) [static]

7.46.2.18 static int yaml_parser_process_empty_scalar (yaml_parser_t * *parser,* yaml_event_t * *event,* yaml_mark_t *mark*) [static]

7.46.2.19 static int yaml_parser_set_parser_error (yaml_parser_t * *parser,* const char * *problem,* yaml_mark_t *problem_mark*) [static]

7.46.2.20 static int yaml_parser_set_parser_error_context (yaml_parser_t * *parser,* const char * *context,* yaml_mark_t *context_mark,* const char * *problem,* yaml_mark_t *problem_mark*) [static]

7.46.2.21 static int yaml_parser_state_machine (yaml_parser_t * *parser,* yaml_event_t * *event*) [static]

7.47 /Users/aladshaw3/projects/ecosystem/src/reader.c File Reference

```
#include "yaml_private.h"
```

Macros

- #define BOM_UTF8 "\xef\xbb\xbf"
- #define BOM_UTF16LE "\xff\xfe"
- #define BOM_UTF16BE "\xfe\xff"

Functions

- static int yaml_parser_set_reader_error (yaml_parser_t *parser, const char *problem, size_t offset, int value)
- static int yaml_parser_update_raw_buffer (yaml_parser_t *parser)
- static int yaml_parser_determine_encoding (yaml_parser_t *parser)
- yaml_parser_update_buffer (yaml_parser_t *parser, size_t length)

7.47.1 Macro Definition Documentation

7.47.1.1 #define BOM_UTF16BE "\xfe\xff"

7.47.1.2 #define BOM_UTF16LE "\xff\xfe"

7.47.1.3 #define BOM_UTF8 "\xef\xbb\xbf"

7.47.2 Function Documentation

7.47.2.1 static int yaml_parser_determine_encoding (yaml_parser_t * *parser*) [static]

7.47.2.2 static int yaml_parser_set_reader_error (yaml_parser_t * *parser,* const char * *problem,* size_t *offset,* int *value*) [static]

7.47.2.3 yaml_parser_update_buffer (yaml_parser_t * *parser,* size_t *length*)

7.47.2.4 static int yaml_parser_update_raw_buffer (yaml_parser_t * *parser*) [static]

7.48 /Users/aladshaw3/projects/ecosystem/src/sandbox.cpp File Reference

```
#include "sandbox.h"
```

Functions

- int Speciation_Test01_Function (const Matrix< double > &x, Matrix< double > &F, const void *res_data)
- int Speciation_Test01_Jacobian (const Matrix< double > &x, Matrix< double > &J, const void *precon_data)
- int Speciation_Test01_Guess (const void *user_data)
- int Speciation_Test01_MatVec (const Matrix< double > &x, Matrix< double > &Ax, const void *matvec_data)
- int RUN_SANDBOX ()

7.48.1 Function Documentation

7.48.1.1 int RUN_SANDBOX ( )

7.48.1.2 int Speciation_Test01_Function (const Matrix< double > & *x*, Matrix< double > & *F*, const void * *res_data*)

7.48.1.3 int Speciation_Test01_Guess (const void * *user_data*)

7.48.1.4 int Speciation_Test01_Jacobian (const Matrix< double > & *x*, Matrix< double > & *J*, const void * *precon_data*)

7.48.1.5 int Speciation_Test01_MatVec (const Matrix< double > & *x*, Matrix< double > & *Ax*, const void * *matvec_data*)

7.49 /Users/aladshaw3/projects/ecosystem/src/scanner.c File Reference

```
#include "yaml_private.h"
```

Macros

- #define CACHE(parser, length)
- #define SKIP(parser)
- #define SKIP_LINE(parser)
- #define READ(parser, string)
- #define READ_LINE(parser, string)
- #define MAX_NUMBER_LENGTH 9

Functions

- yaml_parser_scan (yaml_parser_t *parser, yaml_token_t *token)
- static int yaml_parser_set_scanner_error (yaml_parser_t *parser, const char *context, yaml_mark_t context_mark, const char *problem)
- yaml_parser_fetch_more_tokens (yaml_parser_t *parser)
- static int yaml_parser_fetch_next_token (yaml_parser_t *parser)
- static int yaml_parser_stale_simple_keys (yaml_parser_t *parser)
- static int yaml_parser_save_simple_key (yaml_parser_t *parser)
- static int yaml_parser_remove_simple_key (yaml_parser_t *parser)
- static int yaml_parser_increase_flow_level (yaml_parser_t *parser)
- static int yaml_parser_decrease_flow_level (yaml_parser_t *parser)

- static int yaml_parser_roll_indent (yaml_parser_t *parser, ptrdiff_t column, ptrdiff_t number, yaml_token_type_t type, yaml_mark_t mark)
- static int yaml_parser_unroll_indent (yaml_parser_t *parser, ptrdiff_t column)
- static int yaml_parser_fetch_stream_start (yaml_parser_t *parser)
- static int yaml_parser_fetch_stream_end (yaml_parser_t *parser)
- static int yaml_parser_fetch_directive (yaml_parser_t *parser)
- static int yaml_parser_fetch_document_indicator (yaml_parser_t *parser, yaml_token_type_t type)
- static int yaml_parser_fetch_flow_collection_start (yaml_parser_t *parser, yaml_token_type_t type)
- static int yaml_parser_fetch_flow_collection_end (yaml_parser_t *parser, yaml_token_type_t type)
- static int yaml_parser_fetch_flow_entry (yaml_parser_t *parser)
- static int yaml_parser_fetch_block_entry (yaml_parser_t *parser)
- static int yaml_parser_fetch_key (yaml_parser_t *parser)
- static int yaml_parser_fetch_value (yaml_parser_t *parser)
- static int yaml_parser_fetch_anchor (yaml_parser_t *parser, yaml_token_type_t type)
- static int yaml_parser_fetch_tag (yaml_parser_t *parser)
- static int yaml_parser_fetch_block_scalar (yaml_parser_t *parser, int literal)
- static int yaml_parser_fetch_flow_scalar (yaml_parser_t *parser, int single)
- static int yaml_parser_fetch_plain_scalar (yaml_parser_t *parser)
- static int yaml_parser_scan_to_next_token (yaml_parser_t *parser)
- static int yaml_parser_scan_directive (yaml_parser_t *parser, yaml_token_t *token)
- static int yaml_parser_scan_directive_name (yaml_parser_t *parser, yaml_mark_t start_mark, yaml_char_t **name)
- static int yaml_parser_scan_version_directive_value (yaml_parser_t *parser, yaml_mark_t start_mark, int *major, int *minor)
- static int yaml_parser_scan_version_directive_number (yaml_parser_t *parser, yaml_mark_t start_mark, int *number)
- static int yaml_parser_scan_tag_directive_value (yaml_parser_t *parser, yaml_mark_t mark, yaml_char_t **handle, yaml_char_t **prefix)
- static int yaml_parser_scan_anchor (yaml_parser_t *parser, yaml_token_t *token, yaml_token_type_t type)
- static int yaml_parser_scan_tag (yaml_parser_t *parser, yaml_token_t *token)
- static int yaml_parser_scan_tag_handle (yaml_parser_t *parser, int directive, yaml_mark_t start_mark, yaml_char_t **handle)
- static int yaml_parser_scan_tag_uri (yaml_parser_t *parser, int directive, yaml_char_t *head, yaml_mark_t start_mark, yaml_char_t **uri)
- static int yaml_parser_scan_uri_escapes (yaml_parser_t *parser, int directive, yaml_mark_t start_mark, yaml_string_t *string)
- static int yaml_parser_scan_block_scalar (yaml_parser_t *parser, yaml_token_t *token, int literal)
- static int yaml_parser_scan_block_scalar_breaks (yaml_parser_t *parser, int *indent, yaml_string_t *breaks, yaml_mark_t start_mark, yaml_mark_t *end_mark)
- static int yaml_parser_scan_flow_scalar (yaml_parser_t *parser, yaml_token_t *token, int single)
- static int yaml_parser_scan_plain_scalar (yaml_parser_t *parser, yaml_token_t *token)

7.49.1 Macro Definition Documentation

7.49.1.1 #define CACHE(*parser, length*)

Value:

```
(parser->unread >= (length)                                             \
        ? 1                                                                 \
        : yaml_parser_update_buffer(parser, (length)))
```

7.49.1.2 #define MAX_NUMBER_LENGTH 9

7.49.1.3 #define READ(*parser, string*)

Value:

```
(STRING_EXTEND(parser,string) ?                                         \
         (COPY(string,parser->buffer),                                      \
          parser->mark.index ++,                                            \
          parser->mark.column ++,                                           \
          parser->unread --,                                                \
          1) : 0)
```

7.49.1.4 #define READ_LINE(*parser, string*)

7.49.1.5 #define SKIP(*parser*)

Value:

```
(parser->mark.index ++,                                                 \
      parser->mark.column ++,                                               \
      parser->unread --,                                                    \
      parser->buffer.pointer += WIDTH(parser->buffer))
```

7.49.1.6 #define SKIP_LINE(*parser*)

Value:

```
(IS_CRLF(parser->buffer) ?                                              \
      (parser->mark.index += 2,                                             \
       parser->mark.column = 0,                                             \
       parser->mark.line ++,                                                \
       parser->unread -= 2,                                                 \
       parser->buffer.pointer += 2) :                                       \
      IS_BREAK(parser->buffer) ?                                            \
      (parser->mark.index ++,                                               \
       parser->mark.column = 0,                                             \
       parser->mark.line ++,                                                \
       parser->unread --,                                                   \
       parser->buffer.pointer += WIDTH(parser->buffer)) : 0)
```

7.49.2 Function Documentation

7.49.2.1 static int yaml_parser_decrease_flow_level (yaml_parser_t * *parser*) [static]

7.49.2.2 static int yaml_parser_fetch_anchor (yaml_parser_t * *parser*, yaml_token_type_t *type*) [static]

7.49.2.3 static int yaml_parser_fetch_block_entry (yaml_parser_t * *parser*) [static]

7.49.2.4 static int yaml_parser_fetch_block_scalar (yaml_parser_t * *parser*, int *literal*) [static]

7.49.2.5 static int yaml_parser_fetch_directive (yaml_parser_t * *parser*) [static]

7.49.2.6 static int yaml_parser_fetch_document_indicator (yaml_parser_t * *parser*, yaml_token_type_t *type*) [static]

7.49.2.7 static int yaml_parser_fetch_flow_collection_end (yaml_parser_t * *parser*, yaml_token_type_t *type*) [static]

7.49.2.8 static int yaml_parser_fetch_flow_collection_start (yaml_parser_t * *parser,* yaml_token_type_t *type*) [static]

7.49.2.9 static int yaml_parser_fetch_flow_entry (yaml_parser_t * *parser*) [static]

7.49.2.10 static int yaml_parser_fetch_flow_scalar (yaml_parser_t * *parser,* int *single*) [static]

7.49.2.11 static int yaml_parser_fetch_key (yaml_parser_t * *parser*) [static]

7.49.2.12 yaml_parser_fetch_more_tokens (yaml_parser_t * *parser*)

7.49.2.13 static int yaml_parser_fetch_next_token (yaml_parser_t * *parser*) [static]

7.49.2.14 static int yaml_parser_fetch_plain_scalar (yaml_parser_t * *parser*) [static]

7.49.2.15 static int yaml_parser_fetch_stream_end (yaml_parser_t * *parser*) [static]

7.49.2.16 static int yaml_parser_fetch_stream_start (yaml_parser_t * *parser*) [static]

7.49.2.17 static int yaml_parser_fetch_tag (yaml_parser_t * *parser*) [static]

7.49.2.18 static int yaml_parser_fetch_value (yaml_parser_t * *parser*) [static]

7.49.2.19 static int yaml_parser_increase_flow_level (yaml_parser_t * *parser*) [static]

7.49.2.20 static int yaml_parser_remove_simple_key (yaml_parser_t * *parser*) [static]

7.49.2.21 static int yaml_parser_roll_indent (yaml_parser_t * *parser,* ptrdiff_t *column,* ptrdiff_t *number,* yaml_token_type_t *type,* yaml_mark_t *mark*) [static]

7.49.2.22 static int yaml_parser_save_simple_key (yaml_parser_t * *parser*) [static]

7.49.2.23 static int yaml_parser_scan_anchor (yaml_parser_t * *parser,* yaml_token_t * *token,* yaml_token_type_t *type*) [static]

7.49.2.24 static int yaml_parser_scan_block_scalar (yaml_parser_t * *parser,* yaml_token_t * *token,* int *literal*) [static]

7.49.2.25 static int yaml_parser_scan_block_scalar_breaks (yaml_parser_t * *parser,* int * *indent,* yaml_string_t * *breaks,* yaml_mark_t *start_mark,* yaml_mark_t * *end_mark*) [static]

7.49.2.26 int yaml_parser_scan_directive (yaml_parser_t * *parser,* yaml_token_t * *token*) [static]

7.49.2.27 static int yaml_parser_scan_directive_name (yaml_parser_t * *parser,* yaml_mark_t *start_mark,* yaml_char_t ** *name*) [static]

7.49.2.28 static int yaml_parser_scan_flow_scalar (yaml_parser_t * *parser,* yaml_token_t * *token,* int *single*) [static]

7.49.2.29 static int yaml_parser_scan_plain_scalar (yaml_parser_t * *parser,* yaml_token_t * *token*) [static]

7.49.2.30 static int yaml_parser_scan_tag (yaml_parser_t * *parser,* yaml_token_t * *token*) [static]

7.49.2.31 static int yaml_parser_scan_tag_directive_value (yaml_parser_t * *parser,* yaml_mark_t *mark,* yaml_char_t ** *handle,* yaml_char_t ** *prefix*) [static]

7.49.2.32 static int yaml_parser_scan_tag_handle (yaml_parser_t * *parser,* int *directive,* yaml_mark_t *start_mark,* yaml_char_t ** *handle*) [static]

7.49.2.33 static int yaml_parser_scan_tag_uri (yaml_parser_t * *parser,* int *directive,* yaml_char_t * *head,* yaml_mark_t *start_mark,* yaml_char_t ** *uri*) [static]

7.49.2.34 static int yaml_parser_scan_to_next_token (yaml_parser_t * *parser*) [static]

7.49.2.35 static int yaml_parser_scan_uri_escapes (yaml_parser_t * *parser,* int *directive,* yaml_mark_t *start_mark,* yaml_string_t * *string*) [static]

7.49.2.36 static int yaml_parser_scan_version_directive_number (yaml_parser_t * *parser,* yaml_mark_t *start_mark,* int * *number*) [static]

7.49.2.37 static int yaml_parser_scan_version_directive_value (yaml_parser_t * *parser,* yaml_mark_t *start_mark,* int * *major,* int * *minor*) [static]

7.49.2.38 static int yaml_parser_set_scanner_error (yaml_parser_t * *parser,* const char * *context,* yaml_mark_t *context_mark,* const char * *problem*) [static]

7.49.2.39 static int yaml_parser_stale_simple_keys (yaml_parser_t * *parser*) [static]

7.49.2.40 static int yaml_parser_unroll_indent (yaml_parser_t * *parser,* ptrdiff_t *column*) [static]

7.50 /Users/aladshaw3/projects/ecosystem/src/scopsowl.cpp File Reference

```
#include "scopsowl.h"
```

Functions

- void print2file_species_header (FILE *Output, SCOPSOWL_DATA *owl_dat, int i)
- void print2file_SCOPSOWL_time_header (FILE *Output, SCOPSOWL_DATA *owl_dat, int i)
- void print2file_SCOPSOWL_header (SCOPSOWL_DATA *owl_dat)
- void print2file_SCOPSOWL_result_old (SCOPSOWL_DATA *owl_dat)
- void print2file_SCOPSOWL_result_new (SCOPSOWL_DATA *owl_dat)
- double default_adsorption (int i, int l, const void *user_data)
- double default_retardation (int i, int l, const void *user_data)
- double default_pore_diffusion (int i, int l, const void *user_data)
- double default_surf_diffusion (int i, int l, const void *user_data)
- double default_effective_diffusion (int i, int l, const void *user_data)
- double const_pore_diffusion (int i, int l, const void *user_data)
- double default_filmMassTransfer (int i, const void *user_data)
- double const_filmMassTransfer (int i, const void *user_data)
- int setup_SCOPSOWL_DATA (FILE *file, double(*eval_sorption)(int i, int l, const void *user_data), double(*eval_retardation)(int i, int l, const void *user_data), double(*eval_pore_diff)(int i, int l, const void *user_data), double(*eval_filmMT)(int i, const void *user_data), double(*eval_surface_diff)(int i, int l, const void *user_data), const void *user_data, MIXED_GAS *gas_data, SCOPSOWL_DATA *owl_data)
- int SCOPSOWL_Executioner (SCOPSOWL_DATA *owl_dat)
- int set_SCOPSOWL_ICs (SCOPSOWL_DATA *owl_dat)
- int set_SCOPSOWL_timestep (SCOPSOWL_DATA *owl_dat)
- int SCOPSOWL_preprocesses (SCOPSOWL_DATA *owl_dat)
- int set_SCOPSOWL_params (const void *user_data)
- int SCOPSOWL_postprocesses (SCOPSOWL_DATA *owl_dat)
- int SCOPSOWL_reset (SCOPSOWL_DATA *owl_dat)

- int SCOPSOWL (SCOPSOWL_DATA *owl_dat)
- int LARGE_CYCLE_TEST01 (SCOPSOWL_DATA *owl_dat)
- int SMALL_CYCLE_TEST02 (SCOPSOWL_DATA *owl_dat)
- int CURVE_TEST03 (SCOPSOWL_DATA *owl_dat)
- int CURVE_TEST04 (SCOPSOWL_DATA *owl_dat)
- int CURVE_TEST05 (SCOPSOWL_DATA *owl_dat)
- int SCOPSOWL_SCENARIOS (const char *scene, const char *sorbent, const char *comp, const char *sorbate)
- int SCOPSOWL_TESTS ()

7.50.1 Function Documentation

7.50.1.1 double const_filmMassTransfer (int *i,* const void * *user_data*)

7.50.1.2 double const_pore_diffusion (int *i,* int *l,* const void * *user_data*)

7.50.1.3 int CURVE_TEST03 (SCOPSOWL_DATA * *owl_dat*)

7.50.1.4 int CURVE_TEST04 (SCOPSOWL_DATA * *owl_dat*)

7.50.1.5 int CURVE_TEST05 (SCOPSOWL_DATA * *owl_dat*)

7.50.1.6 double default_adsorption (int *i,* int *l,* const void * *user_data*)

7.50.1.7 double default_effective_diffusion (int *i,* int *l,* const void * *user_data*)

7.50.1.8 double default_filmMassTransfer (int *i,* const void * *user_data*)

7.50.1.9 double default_pore_diffusion (int *i,* int *l,* const void * *user_data*)

7.50.1.10 double default_retardation (int *i,* int *l,* const void * *user_data*)

7.50.1.11 double default_surf_diffusion (int *i,* int *l,* const void * *user_data*)

7.50.1.12 int LARGE_CYCLE_TEST01 (SCOPSOWL_DATA * *owl_dat*)

7.50.1.13 void print2file_SCOPSOWL_header (SCOPSOWL_DATA * *owl_dat*)

7.50.1.14 void print2file_SCOPSOWL_result_new (SCOPSOWL_DATA * *owl_dat*)

7.50.1.15 void print2file_SCOPSOWL_result_old (SCOPSOWL_DATA * *owl_dat*)

7.50.1.16 void print2file_SCOPSOWL_time_header (FILE * *Output,* SCOPSOWL_DATA * *owl_dat,* int *i*)

7.50.1.17 void print2file_species_header (FILE * *Output,* SCOPSOWL_DATA * *owl_dat,* int *i*)

7.50.1.18 int SCOPSOWL (SCOPSOWL_DATA * *owl_dat*)

7.50.1.19 int SCOPSOWL_Executioner (SCOPSOWL_DATA * *owl_dat*)

7.50.1.20 int SCOPSOWL_postprocesses (SCOPSOWL_DATA * *owl_dat*)

7.50.1.21 int SCOPSOWL_preprocesses (SCOPSOWL_DATA * *owl_dat*)

7.50.1.22 int SCOPSOWL_reset (SCOPSOWL_DATA * *owl_dat*)

7.50.1.23 int SCOPSOWL_SCENARIOS (const char * *scene,* const char * *sorbent,* const char * *comp,* const char * *sorbate*)

7.50.1.24 int SCOPSOWL_TESTS ( )

7.50.1.25 int set_SCOPSOWL_ICs (SCOPSOWL_DATA * *owl_dat*)

7.50.1.26 int set_SCOPSOWL_params (const void * *user_data*)

7.50.1.27 int set_SCOPSOWL_timestep (SCOPSOWL_DATA * *owl_dat*)

7.50.1.28 int setup_SCOPSOWL_DATA (FILE * *file,* double(*)(int i, int l, const void *user_data) *eval_sorption,* double(*)(int i, int l, const void *user_data) *eval_retardation,* double(*)(int i, int l, const void *user_data) *eval_pore_diff,* double(*)(int i, const void *user_data) *eval_filmMT,* double(*)(int i, int l, const void *user_data) *eval_surface_diff,* const void * *user_data,* MIXED_GAS * *gas_data,* SCOPSOWL_DATA * *owl_data*)

7.50.1.29 int SMALL_CYCLE_TEST02 (SCOPSOWL_DATA * *owl_dat*)

7.51 /Users/aladshaw3/projects/ecosystem/src/scopsowl_opt.cpp File Reference

```
#include "scopsowl_opt.h"
```

Functions

- int SCOPSOWL_OPT_set_y (SCOPSOWL_OPT_DATA *owl_opt)
- int initial_guess_SCOPSOWL (SCOPSOWL_OPT_DATA *owl_opt)
- void eval_SCOPSOWL_Uptake (const double *par, int m_dat, const void *data, double *fvec, int *info)
- int SCOPSOWL_OPTIMIZE (const char *scene, const char *sorbent, const char *comp, const char *sorbate, const char *data)

7.51.1 Function Documentation

7.51.1.1 void eval_SCOPSOWL_Uptake (const double * *par,* int *m_dat,* const void * *data,* double * *fvec,* int * *info*)

7.51.1.2 int initial_guess_SCOPSOWL (SCOPSOWL_OPT_DATA * *owl_opt*)

7.51.1.3 int SCOPSOWL_OPT_set_y (SCOPSOWL_OPT_DATA * *owl_opt*)

7.51.1.4 int SCOPSOWL_OPTIMIZE (const char * *scene,* const char * *sorbent,* const char * *comp,* const char * *sorbate,* const char * *data*)

7.52 /Users/aladshaw3/projects/ecosystem/src/shark.cpp File Reference

```
#include "shark.h"
```

Functions

- void print2file_shark_info (SHARK_DATA *shark_dat)
- void print2file_shark_header (SHARK_DATA *shark_dat)
- void print2file_shark_results_new (SHARK_DATA *shark_dat)
- void print2file_shark_results_old (SHARK_DATA *shark_dat)
- int ideal_solution (const Matrix< double > &x, Matrix< double > &F, const void *data)

- int Davies_equation (const Matrix< double > &x, Matrix< double > &F, const void *data)
- int DebyeHuckel_equation (const Matrix< double > &x, Matrix< double > &F, const void *data)
- int DaviesLadshaw_equation (const Matrix< double > &x, Matrix< double > &F, const void *data)
- int act_choice (const std::string &input)
- bool linesearch_choice (const std::string &input)
- int linearsolve_choice (const std::string &input)
- int Convert2LogConcentration (const Matrix< double > &x, Matrix< double > &logx)
- int Convert2Concentration (const Matrix< double > &logx, Matrix< double > &x)
- int read_scenario (SHARK_DATA *shark_dat)
- int read_options (SHARK_DATA *shark_dat)
- int read_species (SHARK_DATA *shark_dat)
- int read_massbalance (SHARK_DATA *shark_dat)
- int read_equilrxn (SHARK_DATA *shark_dat)
- int read_unsteadyrxn (SHARK_DATA *shark_dat)
- int setup_SHARK_DATA (FILE *file, int(*residual)(const Matrix< double > &x, Matrix< double > &res, const void *data), int(*activity)(const Matrix< double > &x, Matrix< double > &gama, const void *data), int(*precond)(const Matrix< double > &r, Matrix< double > &p, const void *data), SHARK_DATA *dat, const void *activity_data, const void *residual_data, const void *precon_data, const void *other_data)
- int shark_add_customResidual (int i, double(*other_res)(const Matrix< double > &x, SHARK_DATA *shark_dat, const void *other_data), SHARK_DATA *shark_dat)
- int shark_parameter_check (SHARK_DATA *shark_dat)
- int shark_energy_calculations (SHARK_DATA *shark_dat)
- int shark_temperature_calculations (SHARK_DATA *shark_dat)
- int shark_pH_finder (SHARK_DATA *shark_dat)
- int shark_guess (SHARK_DATA *shark_dat)
- int shark_initial_conditions (SHARK_DATA *shark_dat)
- int shark_executioner (SHARK_DATA *shark_dat)
- int shark_timestep_const (SHARK_DATA *shark_dat)
- int shark_timestep_adapt (SHARK_DATA *shark_dat)
- int shark_preprocesses (SHARK_DATA *shark_dat)
- int shark_solver (SHARK_DATA *shark_dat)
- int shark_postprocesses (SHARK_DATA *shark_dat)
- int shark_reset (SHARK_DATA *shark_dat)
- int shark_residual (const Matrix< double > &x, Matrix< double > &F, const void *data)
- int SHARK (SHARK_DATA *shark_dat)
- int SHARK_SCENARIO (const char *yaml_input)
- int SHARK_TESTS ()

7.52.1 Function Documentation

7.52.1.1 int act_choice (const std::string & *input*)

7.52.1.2 int Convert2Concentration (const **Matrix**< double > & *logx*, **Matrix**< double > & *x*)

7.52.1.3 int Convert2LogConcentration (const **Matrix**< double > & *x*, **Matrix**< double > & *logx*)

7.52.1.4 int Davies_equation (const **Matrix**< double > & *x*, **Matrix**< double > & *F*, const void * *data*)

7.52.1.5 int DaviesLadshaw_equation (const **Matrix**< double > & *x*, **Matrix**< double > & *F*, const void * *data*)

7.52.1.6 int DebyeHuckel_equation (const **Matrix**< double > & *x*, **Matrix**< double > & *F*, const void * *data*)

7.52.1.7 int ideal_solution (const **Matrix**< double > & *x*, **Matrix**< double > & *F*, const void * *data*)

7.52.1.8 int linearsolve_choice (const std::string & *input*)

7.52.1.9 bool linesearch_choice (const std::string & *input*)

7.52.1.10 void print2file_shark_header (SHARK_DATA * *shark_dat*)

7.52.1.11 void print2file_shark_info (SHARK_DATA * *shark_dat*)

7.52.1.12 void print2file_shark_results_new (SHARK_DATA * *shark_dat*)

7.52.1.13 void print2file_shark_results_old (SHARK_DATA * *shark_dat*)

7.52.1.14 int read_equilrxn (SHARK_DATA * *shark_dat*)

7.52.1.15 int read_massbalance (SHARK_DATA * *shark_dat*)

7.52.1.16 int read_options (SHARK_DATA * *shark_dat*)

7.52.1.17 int read_scenario (SHARK_DATA * *shark_dat*)

7.52.1.18 int read_species (SHARK_DATA * *shark_dat*)

7.52.1.19 int read_unsteadyrxn (SHARK_DATA * *shark_dat*)

7.52.1.20 int setup_SHARK_DATA (FILE * *file,* int(*)(const Matrix< double > &x, Matrix< double > &res, const void *data) *residual,* int(*)(const Matrix< double > &x, Matrix< double > &gama, const void *data) *activity,* int(*)(const Matrix< double > &r, Matrix< double > &p, const void *data) *precond,* SHARK_DATA * *dat,* const void * *activity_data,* const void * *residual_data,* const void * *precon_data,* const void * *other_data*)

7.52.1.21 int SHARK (SHARK_DATA * *shark_dat*)

7.52.1.22 int shark_add_customResidual (int *i,* double(*)(const Matrix< double > &x, SHARK_DATA *shark_dat, const void *other_data) *other_res,* SHARK_DATA * *shark_dat*)

7.52.1.23 int shark_energy_calculations (SHARK_DATA * *shark_dat*)

7.52.1.24 int shark_executioner (SHARK_DATA * *shark_dat*)

7.52.1.25 int shark_guess (SHARK_DATA * *shark_dat*)

7.52.1.26 int shark_initial_conditions (SHARK_DATA * *shark_dat*)

7.52.1.27 int shark_parameter_check (SHARK_DATA * *shark_dat*)

7.52.1.28 int shark_pH_finder (SHARK_DATA * *shark_dat*)

7.52.1.29 int shark_postprocesses (SHARK_DATA * *shark_dat*)

7.52.1.30 int shark_preprocesses (SHARK_DATA * *shark_dat*)

7.52.1.31 int shark_reset (SHARK_DATA * *shark_dat*)

7.52.1.32 int shark_residual (const Matrix< double > & *x,* Matrix< double > & *F,* const void * *data*)

7.52.1.33 int SHARK_SCENARIO (const char * *yaml_input*)

7.52.1.34 int shark_solver (SHARK_DATA * *shark_dat*)

7.52.1.35 int shark_temperature_calculations (SHARK_DATA * *shark_dat*)

7.52.1.36 int SHARK_TESTS ( )

7.52.1.37 int shark_timestep_adapt (SHARK_DATA * *shark_dat*)

7.52.1.38 int shark_timestep_const (SHARK_DATA * *shark_dat*)

7.53 /Users/aladshaw3/projects/ecosystem/src/skua.cpp File Reference

```
#include "skua.h"
```

Functions

- void print2file_species_header (FILE *Output, SKUA_DATA *skua_dat, int i)
- void print2file_SKUA_time_header (FILE *Output, SKUA_DATA *skua_dat, int i)
- void print2file_SKUA_header (SKUA_DATA *skua_dat)
- void print2file_SKUA_results_old (SKUA_DATA *skua_dat)
- void print2file_SKUA_results_new (SKUA_DATA *skua_dat)
- double default_Dc (int i, int l, const void *data)
- double default_kf (int i, const void *data)
- double const_Dc (int i, int l, const void *data)
- double simple_darken_Dc (int i, int l, const void *data)
- double theoretical_darken_Dc (int i, int l, const void *data)
- double empirical_kf (int i, const void *data)
- double const_kf (int i, const void *data)
- int molefractionCheck (SKUA_DATA *skua_dat)
- int setup_SKUA_DATA (FILE *file, double(*eval_Dc)(int i, int l, const void *user_data), double(*eval_Kf)(int i, const void *user_data), const void *user_data, MIXED_GAS *gas_data, SKUA_DATA *skua_dat)
- int SKUA_Executioner (SKUA_DATA *skua_dat)
- int set_SKUA_ICs (SKUA_DATA *skua_dat)
- int set_SKUA_timestep (SKUA_DATA *skua_dat)
- int SKUA_preprocesses (SKUA_DATA *skua_dat)
- int set_SKUA_params (const void *user_data)
- int SKUA_postprocesses (SKUA_DATA *skua_dat)
- int SKUA_reset (SKUA_DATA *skua_dat)
- int SKUA (SKUA_DATA *skua_dat)
- int SKUA_CYCLE_TEST01 (SKUA_DATA *skua_dat)
- int SKUA_CYCLE_TEST02 (SKUA_DATA *skua_dat)
- int SKUA_LOW_TEST03 (SKUA_DATA *skua_dat)
- int SKUA_MID_TEST04 (SKUA_DATA *skua_dat)
- int SKUA_SCENARIOS (const char *scene, const char *sorbent, const char *comp, const char *sorbate)
- int SKUA_TESTS ()

7.53.1 Function Documentation

7.53.1.1 double const_Dc (int *i,* int *l,* const void * *data*)

7.53.1.2 double const_kf (int *i,* const void * *data*)

7.53.1.3 double default_Dc (int *i,* int *l,* const void * *data*)

7.53.1.4 double default_kf (int *i,* const void * *data*)

7.53.1.5 double empirical_kf (int *i,* const void * *data*)

7.53.1.6 int molefractionCheck (SKUA_DATA * *skua_dat*)

7.53.1.7 void print2file_SKUA_header (SKUA_DATA * *skua_dat*)

7.53.1.8 void print2file_SKUA_results_new (SKUA_DATA * *skua_dat*)

7.53.1.9 void print2file_SKUA_results_old (SKUA_DATA * *skua_dat*)

7.53.1.10 void print2file_SKUA_time_header (FILE * *Output,* SKUA_DATA * *skua_dat,* int *i*)

7.53.1.11 void print2file_species_header (FILE * *Output,* SKUA_DATA * *skua_dat,* int *i*)

7.53.1.12 int set_SKUA_ICs (SKUA_DATA * *skua_dat*)

7.53.1.13 int set_SKUA_params (const void * *user_data*)

7.53.1.14 int set_SKUA_timestep (SKUA_DATA * *skua_dat*)

7.53.1.15 int setup_SKUA_DATA (FILE * *file,* double(*)(int i, int l, const void *user_data) *eval_Dc,* double(*)(int i, const void *user_data) *eval_Kf,* const void * *user_data,* MIXED_GAS * *gas_data,* SKUA_DATA * *skua_dat*)

7.53.1.16 double simple_darken_Dc (int *i,* int *l,* const void * *data*)

7.53.1.17 int SKUA (SKUA_DATA * *skua_dat*)

7.53.1.18 int SKUA_CYCLE_TEST01 (SKUA_DATA * *skua_dat*)

7.53.1.19 int SKUA_CYCLE_TEST02 (SKUA_DATA * *skua_dat*)

7.53.1.20 int SKUA_Executioner (SKUA_DATA * *skua_dat*)

7.53.1.21 int SKUA_LOW_TEST03 (SKUA_DATA * *skua_dat*)

7.53.1.22 int SKUA_MID_TEST04 (SKUA_DATA * *skua_dat*)

7.53.1.23 int SKUA_postprocesses (SKUA_DATA * *skua_dat*)

7.53.1.24 int SKUA_preprocesses (SKUA_DATA * *skua_dat*)

7.53.1.25 int SKUA_reset (SKUA_DATA * *skua_dat*)

7.53.1.26 int SKUA_SCENARIOS (const char * *scene,* const char * *sorbent,* const char * *comp,* const char * *sorbate*)

7.53.1.27 int SKUA_TESTS ( )

7.53.1.28 double theoretical_darken_Dc (int *i,* int *l,* const void * *data*)

7.54 /Users/aladshaw3/projects/ecosystem/src/skua_opt.cpp File Reference

```
#include "skua_opt.h"
```

Functions

- int SKUA_OPT_set_y (SKUA_OPT_DATA *skua_opt)
- int initial_guess_SKUA (SKUA_OPT_DATA *skua_opt)
- void eval_SKUA_Uptake (const double *par, int m_dat, const void *data, double *fvec, int *info)
- int SKUA_OPTIMIZE (const char *scene, const char *sorbent, const char *comp, const char *sorbate, const char *data)

7.54.1 Function Documentation

7.54.1.1 void eval_SKUA_Uptake (const double * *par*, int *m_dat*, const void * *data*, double * *fvec*, int * *info*)

7.54.1.2 int initial_guess_SKUA (SKUA_OPT_DATA * *skua_opt*)

7.54.1.3 int SKUA_OPT_set_y (SKUA_OPT_DATA * *skua_opt*)

7.54.1.4 int SKUA_OPTIMIZE (const char * *scene*, const char * *sorbent*, const char * *comp*, const char * *sorbate*, const char * *data*)

7.55 /Users/aladshaw3/projects/ecosystem/src/Trajectory.cpp File Reference

```
#include "Trajectory.h"
```

Functions

- double Magnetic_R (const Matrix< double > &dX, const Matrix< double > &dY, int i, double b, double mu_0, double chi_p, double M, double H0, double a)
- double Magnetic_T (const Matrix< double > &dX, const Matrix< double > &dY, int i, double b, double mu_0, double chi_p, double M, double H0, double a)
- double Grav_R (const Matrix< double > &dX, int i, double b, double rho_p, double rho_f)
- double Grav_T (const Matrix< double > &dX, int i, double b, double rho_p, double rho_f)
- double Van_R (const Matrix< double > &dX, const Matrix< double > &dY, int i, double Hamaker, double b, double a)
- double V_RAD (const Matrix< double > &dX, const Matrix< double > &dY, int i, double V0, double rho_f, double a, double eta)
- double V_THETA (const Matrix< double > &dX, const Matrix< double > &dY, int i, double V0, double rho_f, double a, double eta)
- double Brown_RAD (double n_rand, double m_rand, double sigma_n, double sigma_m)
- double Brown_THETA (double s_rand, double t_rand, double sigma_n, double sigma_m)
- int POLAR (Matrix< double > &POL, const Matrix< double > &dX, const Matrix< double > &dY, const void *data, int i)
- double RADIAL_FORCE (const Matrix< double > &POL, double eta, double b, double mp, double t, double a)
- double TANGENTIAL_FORCE (const Matrix< double > &POL, const Matrix< double > &dY, double eta, double b, double mp, double t, double a, int i)
- int CARTESIAN (const Matrix< double > &POL, Matrix< double > &H, const Matrix< double > &dY, double i, const void *data)
- int DISPLACEMENT (Matrix< double > &dX, Matrix< double > &dY, const Matrix< double > &H, int i)
- int LOCATION (const Matrix< double > &dY, const Matrix< double > &dX, Matrix< double > &X, Matrix< double > &Y, int i)

- double Removal_Efficiency (double Sum_Cap, const void *data)
- int Trajectory_SetupConstants (TRAJECTORY_DATA *dat)
- int Number_Generator (TRAJECTORY_DATA *dat)
- int Run_Trajectory ()

7.55.1 Function Documentation

7.55.1.1 double Brown_RAD (double *n_rand*, double *m_rand*, double *sigma_n*, double *sigma_m*)

7.55.1.2 double Brown_THETA (double *s_rand*, double *t_rand*, double *sigma_n*, double *sigma_m*)

7.55.1.3 int CARTESIAN (const Matrix< double > & *POL*, Matrix< double > & *H*, const Matrix< double > & *dY*, double *i*, const void * *data*)

7.55.1.4 int DISPLACEMENT (Matrix< double > & *dX*, Matrix< double > & *dY*, const Matrix< double > & *H*, int *i*)

7.55.1.5 double Grav_R (const Matrix< double > & *dX*, int *i*, double *b*, double *rho_p*, double *rho_f*)

7.55.1.6 double Grav_T (const Matrix< double > & *dX*, int *i*, double *b*, double *rho_p*, double *rho_f*)

7.55.1.7 int LOCATION (const Matrix< double > & *dY*, const Matrix< double > & *dX*, Matrix< double > & *X*, Matrix< double > & *Y*, int *i*)

7.55.1.8 double Magnetic_R (const Matrix< double > & *dX*, const Matrix< double > & *dY*, int *i*, double *b*, double *mu_0*, double *chi_p*, double *M*, double *H0*, double *a*)

7.55.1.9 double Magnetic_T (const Matrix< double > & *dX*, const Matrix< double > & *dY*, int *i*, double *b*, double *mu_0*, double *chi_p*, double *M*, double *H0*, double *a*)

7.55.1.10 int Number_Generator (TRAJECTORY_DATA * *dat*)

7.55.1.11 int POLAR (Matrix< double > & *POL*, const Matrix< double > & *dX*, const Matrix< double > & *dY*, const void * *data*, int *i*)

7.55.1.12 double RADIAL_FORCE (const Matrix< double > & *POL*, double *eta*, double *b*, double *mp*, double *t*, double *a*)

7.55.1.13 double Removal_Efficiency (double *Sum_Cap*, const void * *data*)

7.55.1.14 int Run_Trajectory ( )

7.55.1.15 double TANGENTIAL_FORCE (const Matrix< double > & *POL*, const Matrix< double > & *dY*, double *eta*, double *b*, double *mp*, double *t*, double *a*, int *i*)

7.55.1.16 int Trajectory_SetupConstants (TRAJECTORY_DATA * *dat*)

7.55.1.17 double V_RAD (const Matrix< double > & *dX*, const Matrix< double > & *dY*, int *i*, double *V0*, double *rho_f*, double *a*, double *eta*)

7.55.1.18 double V_THETA (const Matrix< double > & *dX*, const Matrix< double > & *dY*, int *i*, double *V0*, double *rho_f*, double *a*, double *eta*)

7.55.1.19 double Van_R (const Matrix< double > & *dX*, const Matrix< double > & *dY*, int *i*, double *Hamaker*, double *b*, double *a*)

7.56 /Users/aladshaw3/projects/ecosystem/src/ui.cpp File Reference

```
#include "ui.h"
```

Functions

- void aui_help ()
- void bui_help ()
- std::string allLower (const std::string &input)
- bool exit (const std::string &input)
- bool help (const std::string &input)
- bool version (const std::string &input)
- bool test (const std::string &input)
- bool exec (const std::string &input)
- bool path (const std::string &input)
- bool input (const std::string &input)
- bool valid_test_string (const std::string &input, UI_DATA *ui_dat)
- bool valid_exec_string (const std::string &input, UI_DATA *ui_dat)
- int number_files (UI_DATA *ui_dat)
- bool valid_addon_options (UI_DATA *ui_dat)
- void display_help (UI_DATA *ui_dat)
- void display_version (UI_DATA *ui_dat)
- int invalid_input (int count, int max)
- bool valid_input_main (UI_DATA *ui_dat)
- bool valid_input_tests (UI_DATA *ui_dat)
- bool valid_input_execute (UI_DATA *ui_dat)
- int test_loop (UI_DATA *ui_dat)
- int exec_loop (UI_DATA *ui_dat)
- int run_test (UI_DATA *ui_dat)
- int run_exec (UI_DATA *ui_dat)
- int run_executable (int argc, const char *argv[])

7.56.1 Function Documentation

7.56.1.1 std::string allLower (const std::string & *input*)

7.56.1.2 void aui_help ( )

7.56.1.3 void bui_help ( )

7.56.1.4 void display_help (UI_DATA * *ui_dat*)

7.56.1.5 void display_version (UI_DATA * *ui_dat*)

7.56.1.6 bool exec (const std::string & *input*)

7.56.1.7 int exec_loop (UI_DATA * *ui_dat*)

7.56.1.8 bool exit (const std::string & *input*)

7.56.1.9 bool help (const std::string & *input*)

7.56.1.10 bool input (const std::string & *input*)

7.56.1.11 int invalid_input (int *count,* int *max*)

7.56.1.12 int number_files (**UI_DATA** * *ui_dat*)

7.56.1.13 bool path (const std::string & *input*)

7.56.1.14 int run_exec (**UI_DATA** * *ui_dat*)

7.56.1.15 int run_executable (int *argc,* const char * *argv[]*)

7.56.1.16 int run_test (**UI_DATA** * *ui_dat*)

7.56.1.17 bool test (const std::string & *input*)

7.56.1.18 int test_loop (**UI_DATA** * *ui_dat*)

7.56.1.19 bool valid_addon_options (**UI_DATA** * *ui_dat*)

7.56.1.20 bool valid_exec_string (const std::string & *input,* **UI_DATA** * *ui_dat*)

7.56.1.21 bool valid_input_execute (**UI_DATA** * *ui_dat*)

7.56.1.22 bool valid_input_main (**UI_DATA** * *ui_dat*)

7.56.1.23 bool valid_input_tests (**UI_DATA** * *ui_dat*)

7.56.1.24 bool valid_test_string (const std::string & *input,* **UI_DATA** * *ui_dat*)

7.56.1.25 bool version (const std::string & *input*)

7.57 /Users/aladshaw3/projects/ecosystem/src/writer.c File Reference

```
#include "yaml_private.h"
```

Functions

- static int yaml_emitter_set_writer_error (yaml_emitter_t *emitter, const char *problem)
- yaml_emitter_flush (yaml_emitter_t *emitter)

7.57.1 Function Documentation

7.57.1.1 static int yaml_emitter_set_writer_error (**yaml_emitter_t** * *emitter,* const char * *problem*) [static]

7.58 /Users/aladshaw3/projects/ecosystem/src/yaml_wrapper.cpp File Reference

```
#include "yaml_wrapper.h"
```

Functions

- int YAML_WRAPPER_TESTS ()
- int YAML_CPP_TEST (const char *file)

7.58.1 Function Documentation

7.58.1.1 int YAML_CPP_TEST (const char * *file*)

7.58.1.2 int YAML_WRAPPER_TESTS ( )

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