Compressible Flow Calculator

REST API for calculation of compressible flow relations. Includes Isentropic Flows, Normal Shocks, Oblique Shocks, Fanno Flows, and Rayleigh Flows.
More information: http://www.sierrao.com
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Version: 1.0.0
BasePath:/

Access

Methods

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FannoController

`GET /fanno/{gamma}/{inputType}/{inputValue}`

Up

Returns Fanno flow properties for given input. (**getFannoFlowUsingGET**)

Path parameters

gamma (required)
Path Parameter — The value of gamma, the ratio of specific heats. For air, gamma = 1.4 at standard conditions. format: double

inputType (required)
Path Parameter — Describes the value passed to base the calculations on. Currently only an inputType of 'mach' is supported for Fanno Flow.

inputValue (required)
Path Parameter — The actual value passed to base the calculations on. Currently can only be the mach number for Fanno Flow. format: double

Return type

Fanno

Example data

Content-Type: application/json

```
{
  "popostar" : 5.962133916683182,
  "ttstar" : 7.061401241503109,
  "mach" : 1.4658129805029452,
  "flstard" : 0.8008281904610115,
  "ppstar" : 5.637376656633329,
  "gamma" : 6.027456183070403,
  "sstarsr" : 2.3021358869347655,
  "uustar" : 9.301444243932576
}
```

Produces

This API call produces the following media types according to the Accept request header; the media type will be conveyed by the Content-Type response header.

- `application/json`

Responses

200
OK Fanno
401
Unauthorized
403
Forbidden
404
Not Found

IsentropicController

GET /isentropic/{gamma}/{inputType}/{inputValue}

Up

Returns Isentropic flow properties for given input. (**findIsentropicFlowUsingGET**)

Path parameters

gamma (required)
Path Parameter — The value of gamma, the ratio of specific heats. For air, gamma = 1.4 at standard conditions. format: double

inputType (required)
Path Parameter — Describes the inputValue passed to base the calculations on. Can be 'mach' for Mach number, 'temp' for T/T0 temperature ratio, 'pres' for P/P0 pressure ratio, 'rho' for rho/rho0 density ratio, 'areasub' for A/A* area ratio with the subsonic solution, 'areasuper' for A/A* area ratio with supersonic solution, 'pmangle' for Prandtl-Meyer angle in degrees, or 'machangle' for the Mach angle in degrees

inputValue (required)
Path Parameter — The corresponding value to do calculations on format: double

Return type

Isentropic

Example data

Content-Type: application/json

```
{
  "rhorhoo" : 9.301444243932576,
  "aastar" : 0.8008281904610115,
  "pmangle" : 5.637376656633329,
  "rhorhostar" : 3.616076749251911,
  "ttstar" : 4.145608029883936,
  "mach" : 1.4658129805029452,
  "machangle" : 5.962133916683182,
  "ppstar" : 7.061401241503109,
  "gamma" : 6.027456183070403,
  "ppo" : 2.3021358869347655,
  "tto" : 2.027123023002322
}
```

Produces

This API call produces the following media types according to the Accept request header; the media type will be conveyed by the Content-Type response header.

- `application/json`

Responses

200
OK Isentropic
401
Unauthorized
403
Forbidden
404
Not Found

NormalShockController

`GET /normalshock/{gamma}/{inputType}/{inputValue}`

Up

Returns Normal Shock flow properties for given input. (**findNormalShockUsingGET**)

Path parameters

gamma (required)
Path Parameter — The value of gamma, the ratio of specific heats. For air, gamma = 1.4 at standard conditions. format: double

inputType (required)
Path Parameter — Describes the inputValue passed to base the calculations on. Can be 'mach' for incoming Mach number before the shock wave, 'mach2' for Mach number after the shock wave, 'temp' for T2/T1 temperature ratio, 'pres' for P2/P1 pressure ratio, 'rho' for rho2/rho1 density ratio, 'stagpres' for P02/P01 stagnation pressure ratio, 'presstagpres' for P1/P02 pressure to stagnation pressure ratio

inputValue (required)
Path Parameter — The corresponding value to do calculations on format: double

Return type

NormalShock

Example data

Content-Type: application/json

```
{
  "p1po2" : 5.962133916683182,
  "p2p1" : 5.637376656633329,
  "mach2" : 1.4658129805029452,
  "mach" : 6.027456183070403,
  "po2po1" : 2.3021358869347655,
  "rho2rho1" : 7.061401241503109,
  "gamma" : 0.8008281904610115,
  "t2t1" : 9.301444243932576
}
```

Produces

This API call produces the following media types according to the Accept request header; the media type will be conveyed by the Content-Type response header.

- `application/json`

Responses

200
OK NormalShock
401
Unauthorized
403
Forbidden
404
Not Found

ObliqueShockController

Up

`GET /oblique/{gamma}/{mach}/{secondInputType}/{secondInputValue}`

Returns Oblique Shock flow properties for given inputs. (**findOliqueFlowUsingGET**)

Path parameters

gamma (required)
Path Parameter — The value of gamma, the ratio of specific heats. For air, gamma = 1.4 at standard conditions. format: double

mach (required)
Path Parameter — The incoming Mach number before the shock. format: double

secondInputType (required)
Path Parameter — Describes the secondInputValue passed to base the calculations on. Can be 'mach1n' for the normal component for the incoming Mach number, 'beta' for the shock wave angle beta in degrees, 'thetaweak' for the turn angle theta in degrees assuming a weak shock solution, or 'thetastrong' for the turn angle theta in degrees assuming a strong shock solution

secondInputValue (required)
Path Parameter — The corresponding input value. format: double

Return type

ObliqueShock

Example data

Content-Type: application/json

```
{
  "p2p1" : 7.061401241503109,
  "mach2" : 2.3021358869347655,
  "m2n" : 5.962133916683182,
  "mach" : 5.637376656633329,
  "m1n" : 1.4658129805029452,
  "po2po1" : 9.301444243932576,
  "rho2rho1" : 3.616076749251911,
  "theta" : 4.145608029883936,
  "beta" : 0.8008281904610115,
  "gamma" : 6.027456183070403,
  "t2t1" : 2.027123023002322
}
```

Produces

This API call produces the following media types according to the Accept request header; the media type will be conveyed by the Content-Type response header.

- `application/json`

Responses

200
OK ObliqueShock
401
Unauthorized
403
Forbidden
404
Not Found

RayleighController

GET /rayleigh/{gamma}/{inputType}/{inputValue}

Up

returns Rayleigh flow properties for given input. (**findRayleighFlowUsingGET**)

Path parameters

gamma (required)
Path Parameter — The value of gamma, the ratio of specific heats. For air, gamma = 1.4 at standard conditions. format: double

inputType (required)
Path Parameter — Describes the value passed to base the calculations on. Currently only an inputType of 'mach' is supported for Rayleigh Flow.

inputValue (required)
Path Parameter — The actual value passed to base the calculations on. Currently can only be the mach number for Rayleigh Flow. format: double

Return type

Rayleigh

Example data

Content-Type: application/json

```
{
  "popostar" : 1.4658129805029452,
  "totostar" : 2.3021358869347655,
  "ttstar" : 7.061401241503109,
  "mach" : 6.027456183070403,
  "ppstar" : 5.962133916683182,
  "gamma" : 0.8008281904610115,
  "sstarsr" : 5.637376656633329,
  "uustar" : 9.301444243932576
}
```

Produces

This API call produces the following media types according to the Accept request header; the media type will be conveyed by the Content-Type response header.

- `application/json`

Responses

200
OK Rayleigh
401
Unauthorized
403
Forbidden
404
Not Found

Models

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`Fanno` - Fanno Up

flstard (optional)
Double format: double

gamma (optional)
Double format: double

mach (optional)
Double format: double

popostar (optional)
Double format: double

ppstar (optional)
Double format: double

sstarsr (optional)
Double format: double

ttstar (optional)
Double format: double

uustar (optional)
Double format: double

`Isentropic` - Isentropic Up

aastar (optional)
Double format: double

gamma (optional)
Double format: double

mach (optional)
Double format: double

machangle (optional)

Double format: double

pmangle (optional)
Double format: double

ppo (optional)
Double format: double

ppstar (optional)
Double format: double

rhorhoo (optional)
Double format: double

rhorhostar (optional)
Double format: double

tto (optional)
Double format: double

ttstar (optional)
Double format: double

`NormalShock` - NormalShock

Up

gamma (optional)
Double format: double

mach (optional)
Double format: double

mach2 (optional)
Double format: double

p1po2 (optional)
Double format: double

p2p1 (optional)
Double format: double

po2po1 (optional)
Double format: double

rho2rho1 (optional)
Double format: double

t2t1 (optional)
Double format: double

`ObliqueShock` - ObliqueShock

Up

beta (optional)
Double format: double

gamma (optional)
Double format: double

m1n (optional)
Double format: double

m2n (optional)
Double format: double

mach (optional)
Double format: double

mach2 (optional)
Double format: double

p2p1 (optional)
Double format: double

po2po1 (optional)
Double format: double

rho2rho1 (optional)
Double format: double

t2t1 (optional)
Double format: double

theta (optional)
Double format: double

`Rayleigh` - Rayleigh

Up

gamma (optional)
Double format: double

mach (optional)
Double format: double

popostar (optional)
Double format: double

ppstar (optional)
Double format: double

sstarsr (optional)
Double format: double

totostar (optional)
Double format: double

ttstar (optional)
Double format: double

uustar (optional)
Double format: double