|  |  |
| --- | --- |
| Acctim |  |
| accum\_courant |  |
| adapt\_mesh\_in\_FPI | variable for adapting the mesh in FPI solver |
| After\_adapt | Logical expression (false) |
| After\_adapt\_itime | flag to either enter the pressure solve or not |
| C\_phi\_series | allocatable array |
| Calulate\_mass\_delta | calculate mass change |
| Courant\_number |  |
| courant\_tol |  |
| CV\_funs | control volume shape functions |
| CV\_GIdims | control volume Gaussian integration parameter |
| Density\_field | tensor field options |
| dt | Real, intent (inout) |
| Eles\_wiht\_pipe | pipe coordinates |
| Entersolve | logical(true) |
| Exit\_initialise\_porous\_media | logical(false) |
| Exitnonlinearloop | logical expression for adaptive time stepping |
| FE\_funs, | finite element shape functions |
| FE\_GIdims | finite element Gaussian integration parameters |
| first\_time\_step |  |
| Igot\_theta\_flux | integer for shape function related fields |
| Itime | defining time option |
| Its | integer |
| magma\_phase\_coef | type of magma phase diagram |
| mass\_ele | real, pointer |
| Mdims | multi-dimension |
| Mdisopt, | multi-discretisation options |
| mmat | multi-matrix |
| Mspars | multi-sparsity |
| Multi\_absorb | multi-absorption (magma, porous media) |
| Multicomponent\_state | state type and pointer |
| Ndgl | Conversion from local to global |
| nonlinearadaptTs | nonlinear adaptive time stepping variable |
| old\_acctim | real |
| Outfluxes | multi-outfluxes |
| Packed\_state | state type |
| Pipes\_aux | type of multi-pipe package |
| Porousity\_field | type of vector field |
| Pres\_its\_taken | integer |
| Pressure\_field | type of tensor field |
| Reference\_field | real allocatable array |
| Repeat\_timestep | logical expression(false) |
| saturation\_field | type of tensor field |
| Scalarfield\_source\_store | real multidimension array and pointer |
| SFPI\_taken | integer |
| State | state type |
| Suf\_sig\_diagten\_bc | real allocatable multidimension array |
| Sum\_one\_m\_theta\_flux | real allocatable multidimension array |
| Sum\_one\_m\_theta\_flux\_j | real allocatable multidimension array |
| Sum\_theta\_flux\_j | real allocatable multidimension array |
| T\_adapt\_threshold | real |
| theta\_gdifff | real multidimension pointer array |
| Tracer\_field | type of tensor field |
| Upwnd | variable storing sigma at the interface for porous media |
| Velocity\_field | type of tensor field |

Question:

1571 - trim(option\_name)

635 - What is pipe?

540 - #ifdef

! totele=no of elements,

! nloc=no of nodes per element,

! totele\_nloc=totele\*nloc

! sngi=no of surface quadrature points of the faces - this is set to the max no of all faces.

! ngi=no of surface quadrature points of the faces.

! ndim=no of dimensions - including time possibly,

! nface=no of faces of each elemenet, nc no of fields to solve for.

! shape functions....

! n, nlx are the volume shape functions and their derivatives in local coordinates.

! nlx\_nod are the derivatives of the local coordinates at the nods.

! nlx\_lxx = the 3rd order local derivatives at the nodes.

! face info:

! face\_ele(iface, ele) = given the face no iface and element no return the element next to the surface or if negative return the negative of the surface element number between element ele and face iface.

! face\_list\_no(iface, ele) returns the possible origantation number which defines the numbering of the non-zeros of the nabouting element.

! xc(:,ele) is the centre of the element ele.

! x\_all=coordinates of the nodes