|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **TEST: Dispersion Fletcher Neumann BC** | | | | | | | | | | | | | | | |
| Conceptualization of Test | | | | | | | | | Test Description: (Do we need this?)  Diffusion of initial distribution of mass between 0.1 and 1, and comparing it with analytical solutions, BC introduced based on analytical solution (flux) | | | | | | |
| Test Setup | | | | | | | | | | | | | | | |
| Process Tested | | | | Dispersion Coeff.  (m2/s) | Decay Rate  (1/sec) | | | Flux Limiter | | Domain Length | # Grid Cells | | | Time Step (S) | # Time Steps |
| Advection (Flow) | Diffusion (Mixing) | Reaction (Decay) | |
| - | ✓ | - | | 2.10 | NA | | | NA | | 0.9 m | 16 | | | 1.56E-2 | 16 |
| 32 | | | 3.12E-2 | 32 |
| 64 | | | 6.25E-2 | 64 |
|  | | | | | | | | | | | | | | | |
| Dimensionless Parameters | | | | | | | | | | | | | | | |
| Courant #: Courant Number.png | | | Mesh Peclet #: Mesh Peclet Number.png | | | | Diffusion #: Diffusion Number.png | | | | | DamKohler #  Damkohler Number.png | | | |
| ≤1: required for stability | | | ≤1: dispersion dominant | | | | ≤0: required for stability | | | | | ≤1: Advection dominates | | | |
| NA | | | NA | | | | 165.9, 82.9, 41.5 | | | | | NA | | | |
|  | | |  | | | |  | | | | |  | | | |
|  | | | | | | | | | | | | | | | |
| Test Results | | | | | | | | | | | | | | | |
| Plot of Results | | | | | | | | | Comments :  The initial distribution of mass is diffuses and the result is compared with analytical solution. area and dispersion coefficient are constant. BC is introduced as flux | | | | | | |
| Numerical Order of Accuracy and Convergence | | | | | | | | | | | | | | | |
| Grid Cell Refinement (Increase # Grid Cells) | | Order of Accuracy Measure (L-1norm) Target: ≤ 1% | | | | Convergence Measure  (L-1 norm) Target: value ≥2 | | | | | | | Comments | | |
| 16 - 32 | | 2.065E-2 | | | | 2.00 | | | | | | | Test officially passes the defined criteria | | |
| 5.135E-3 | | | | 2nd Order Accurate | | | | | | |
| 32- 64 | | 1.248E-3 | | | | 2.04 | | | | | | |
| OK | | | | 2nd Order Accurate | | | | | | |
| Bottom Line: (What should I mention here?) | | | | | | | | | | | | | | | |