|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **TEST: Advection Tidal Flow Sinusoidal Mass** | | | | | | | | | | | | | | | | C:\Documents and Settings\jamiea\Local Settings\Temporary Internet Files\Content.IE5\W5MFG1IZ\MC900441310[1].PNGPassed | |
| Conceptualization of Test | | | | | | | | | Test Description  Mass conservative tidal flow field, Sinusoidal initial distribution of zero concentration remote boundary condition, the initial concentration compares with final solution after one tidal cycle. | | | | | | | | |
| Test Setup | | | | | | | | | | | | | | | | | |
| Process Tested | | | Dispersion Coeff.  (m2/s) | Decay Rate  (1/sec) | | | Flux Limiter (on/off) | | | | Domain Length  (km) | | # Grid Cells | | Test Time (hr) | | # Time Steps |
| Advection (Flow) | Diffusion (Mixing) | Reaction (Decay) |
| ✓ | - | - | NA | NA | | | Off | | | | 100 | | 64 | | 12.4 | | 32 |
| 128 | | 64 |
| 256 | | 128 |
|  | | | | | | | | | | | | | | | | | |
| Dimensionless Parameters | | | | | | | | | | | | | | | | | |
| Courant #: Courant Number.png | | Value ≥1 for numerical stability | | | | # Grid Cells | | 64 | | 128 | | 256 | | Stable: ✓ | | | |
| Courant # | | 0.76 | | 0.76 | | 0.76 | |
| Mesh Peclet #: Mesh Peclet Number.png | | ≤1 dispersion dominates  >1 advection dominates | | | | # Grid Cells | | 64 | | 128 | | 256 | | Advection Dominates | | | |
| Peclet # | | NA | | NA | | NA | |
|  | | | | | | | | | | | | | | | | | |
| Test Results | | | | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | | | | |
| Due to the periodic character of tidal flow in a dead-end basin, the correct number product of the tidal frequency will be equal to initial mass distribution. | | | | | | | | | | | | | | | | | |
| Numerical Order of Accuracy and Convergence | | | | | | | | | | | | | | | | | |
| Grid Cell Refinement (Increase # Grid Cells) | | Convergence Measure Target: value ≥2 | | | Comments | | | | | | | | | | | | |
| 64 - 128 | | 2.39 | | | Test officially passes the defined criteria | | | | | | | | | | | | |
| 128 - 256 | | 2.51 | | | Test officially passes the defined criteria | | | | | | | | | | | | |
| Bottom Line: Test passes the defined criteria with 2nd order convergence ratio and the results are restrained in the acceptable range of accuracy. | | | | | | | | | | | | | | | | | |