Sediment and Transport Module Report Card

Testing of Single Channel Transport Code

A Sediment and Transport Module (STM) is being developed for the Delta Simulation Model 2 (DSM2). To ensure that each portion of the newly developed code works properly, code tests have been created. This report card summarizes the current code tests and results for STM.

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| **Test Name** | **Test Result** |
| Advection (plug flow) |  |
| Uniform unidirectional flow, Gaussian mass distribution, zero concentration BC[[1]](#footnote-1) | Passed |
| Uniform bidirectional flow, Gaussian mass distribution, zero concentration remote BC | Passed |
| Uniform bidirectional flow, Gaussian mass distribution, specified concentration BC | Passed |
| Tidal flow, Gaussian distribution of mass, zero concentration remote BC | Passed |
| Tidal flow, Sinusoidal distribution of mass, zero concentration remote BC | Passed |
| Diffusion (mixing) |  |
| Smooth distribution of mass, concentration value BC (Fletcher, 1991[[2]](#footnote-2)) | Passed |
| Smooth distribution of mass, flux value BC (Fletcher, 19912) | Passed |
| Gaussian distribution of mass, zero concentration value BC | Passed |
| Gaussian distribution of mass, flux value BC | Passed |
| Reaction (growth/decay) |  |
| Linear decay, 2nd order Heun ordinary differential equation solver | Passed |
| Linear decay, 3rd order Runge-Kutta ordinary differential equation solver | Passed |
| Advection & Diffusion |  |
| Uniform flow, Gaussian mass, concentration remote BC, constant dispersion coefficient | Passed |
| Uniform flow, Gaussian mass, value concentration BC, constant dispersion coefficient | review |
| Spatially varying flow and dispersion coefficient (Zoppou & Knight, 1998) | review |
| Temporally varying flow and dispersion coefficient (Crank, 1975) | **~** In progress |
| Advection & Reaction |  |
| Uniform flow, Gaussian mass distribution, linear decay | Passed |
| Tidal flow, Gaussian distribution of mass, zero concentration remote BC, linear decay | Passed |
| Tidal flow, sinusoidal distribution of mass, zero concentration remote BC, linear decay | Passed |
| Advection, Diffusion & Reaction |  |
| Uniform flow, Gaussian mass, specified conc. BC, const. dispersion coeff., linear decay | review |
| Uniform flow, Gaussian mass, remote conc. BC, const. dispersion coeff., linear decay | review |
| Non-uniform flow, time and spatially varying disp. coefficient, non-linear decay | **~** In progress |

1. Boundary Condition [↑](#footnote-ref-1)
2. Page 238 [↑](#footnote-ref-2)