

## **Modelling seabed ploughing using the Material Point Method**

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Ploughing is a complex process for which to devise numerical models since it involves material and geometric nonlinearity and is truly 3-dimensional. The Material Point Method (MPM) seems to be a good contender for this modelling since it decouples the deformation of the problem domain from the discretisation framework. This presentation describes recent UK research that has paired numerical modelling of ploughing using the MPM with laboratory experimentation, the latter to provide strong validation to the former. Various issues that have been met with in the development of the MPM to provide the ploughing model are discussed, such as dealing with essential boundary conditions and proper implementation of plasticity models. The standard MPM is shown to be a robust choice in comparison to more complex approaches, such as the GIMP and CPDI methods, which seek to reduce the cell-crossing instability but bring additional problems or complexities.