

A nonlocal model for dune morphodynamics

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We will introduce a PDE describing the morphodynamics of sand dunes sheared by a fluid flow, recently proposed by Andrew C. Fowler. This model involves a nonlocal term which can be seen as an anti-diffusive fractional differential operator. We propose numerical schemes based on finite difference and splitting methods to approximate the solutions of this equation. Numerical stability and convergence of these schemes are investigated. To finish with, we will see that this model can be also applied to signal processing.