

# High order well balanced methods for gas dynamics with gravity

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I will start from the notion of well balanced schemes, designed to exactly reproduce steady states, illustrating how standard schemes fail to preserve equilibrium solutions. Then I will describe a class of well balanced schemes for Euler equations in a gravitational field which can be written at any order of accuracy, provided one knows before hand around what equilibrium solution the method should be well balanced. Finally, I will consider a more general equilibrium solution, discussing how to construct a well balanced scheme also in this case.

Joint work with Matteo Semplice (Universit di Torino) and Christian Klingenberg (Universitt Wrzburg).