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Turbulence and nuclear reactions in 3D hydrodynamics simulations of massive stars

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Our knowledge of massive star evolution and nucleosynthesis is limited by uncertainties related to multi-dimensional processes taking place in stellar interiors. Only recently, theoretical works are starting to improve 1D stellar evolution codes with the help of 3D hydrodynamics models, which are used to study multi-D processes on a short time range (minutes or hours) and improve 1D prescriptions.
In this talk, I will present results coming from a new set of high-resolution hydrodynamics simulations of the neon-burning shell in a massive star, employing the PROMPI code. I will focus in particular on the interplay between turbulence and nuclear reactions, discussing the impact that different boosting factors of the nuclear rates have on the results.

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