

Relativistic soundproof models

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Many astrophysical scenarios are described by models with a large range of characteristic speeds. When the most interesting behaviour is dominated by slow (eg advective) effects, accounting for everything can be a problem for numerical simulations, significantly increasing errors and run times. However, exploiting the multiscale nature of the models (through soundproof models such as the Low Mach approximation) can filter out the fastest behaviour, leading to qualitative improvements in accuracy and efficiency. We will present methods and numerical results for soundproof models in strongly relativistic rotating spacetimes, aimed at modelling burning on neutron stars.