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The Generation, Evolution and Transport of Turbulence During Structure Formation

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Turbulence in the ICM is a natural consequence of shocks and large-scale sheared flows produced in structure formation during mergers and from accretion, more generally. This is demonstrated in many simulations. However, the physical conditions involved in turbulence generation and evolution in this context are complex and intermittent in both time and space. Consequently they and their relationships are not yet well characterized. To improve this understanding we have undertaken a high resolution simulation study designed to isolate the dynamical processes responsible for production, evolution and transport of turbulence in the ICM. The study is based on nested grid, zoomed simulations of multiple cluster formation events with uniform spatial resolution (currently 20 kpc) inside the virial radius and high time resolution (currently ~ 50 Myr) outputs throughout the formation history of each cluster. This talk will outline this effort and present initial results.

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