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Globular Clusters: The Cosmological Context from Coupled Simulations to Sub-grid Models

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Globular clusters (GCs) can be used to probe the Milky Way's accretion history, potential, and dark substructures. Additionally, GCs could provide formation pathways for nuclear star clusters and supermassive black hole seeds. A detailed understanding of GC formation and evolution is therefore necessary, so it is important to capture the relevant physics in cosmological simulations. Several high-performance codes can successfully model the collisional dynamics of GCs, which can then be coupled to collisionless galaxy formation codes; however, this approach is too expensive to carry out in explicit cosmological simulations, so either post-processing or sub-grid models are required. We are developing and testing sub-grid prescriptions for GC formation and evolution to be added to the RAMSES galaxy evolution code. In this poster, I will present our current progress in testing models for GC evolution using the AMUSE framework to carry out coupled GC–galaxy simulations. Our next steps will be to add this into RAMSES and begin testing models of GC formation using sink particles.

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