Z310a   The 3 million simulations of globular clusters using Fugaku computer

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The Dragon models with million stars are the milestone for the realistic numerical simulations of globular clusters (GCs) up to Hubble time. However, these models have low densities and low fractions of binaries that are different from the typical GCs. In order to predict the formation rate and properties of gravitational wave sources and understand how the tidal streams form and evolve, we need better models. Recently, we developed a high-performance N-body code, PeTar, that can achieve this goal. We show the performance scaling on the supercomputers, XC50 at CFCA, NAOJ and Fugaku at RIKEN-CCS. Using PeTar, we perform the first densest and most massive GC models with 3 million stars and binaries on Fugaku. We show the result of BH/NS mergers in our models performed so far, and compare with the previous studies using approximate methods such as Monte-Carlo models. How stars and binaries are distributed on the tidal tails are also provided, to be compared with the observational data (e.g. Pal 5).