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Viscosity and r-mode damping in stars with quark matter GAUTAM RUPAK, Mississippi State University, PRASHANTH JAIKUMAR, Institute of Mathematical Sciences, India and Argonne National laboratory, ANDREW W. STEINER, Michigan State University — The effect of shear and bulk viscosity on r-mode oscillations in compact stars with quark matter is presented. We consider both the ungapped and gapped color-flavor-locked (CFL) phase of quark matter. In ungapped quark phase r-mode is damped for temperatures 10^8 K -5×10^9 K even for rapid rotations whereas in CFL phase r-mode is not damped in the temperature range 10^{10} K -10^{11} K. We find viscous damping of r-mode in quark matter leads to larger critical frequencies and smaller spin-periods compared to rotating neutron stars.

Gautam Rupak
Mississippi State University

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