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**Threshold Mass for Prompt Blackhole Formation From Binary Neutron Star Mergers** RAHUL KASHYAP, ABHISHEK KUMAR, SURENDRA PADMATA, AVIRAL PRAKASH, DAVID RADICE, Pennsylvania State University — Binary neutron star (BNS) mergers are one of the most violent events in our universe and one of the most important sources in current and future gravitational wave (GW) observatories. Observables from these events reveal properties of supranuclear matter inaccessible to any experiments yet possible on the Earth. There is widespread understanding that mergers result into either a blackhole with an accretion disk or, a differentially rotating massive neutron star. The boundary between these two outcomes as a function of BNSs provides us information about the dynamics of dense matter i.e. equation of state (EOS). We perform a series of simulation using the numerical relativity code Whisky-THC for a range of equation of state to find the threshold value for total mass beyond which system collapses to blackhole promptly without any oscillations. We then compare our result in the literature and comment on EOS-independent relationship for prediction of threshold masses. Such information when compared with future GW will give us unique probes to understand dynamical properties of matter at and above nuclear density.

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