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Neutron Star Binary Coalescences: Angular Momentum Threshold Against a Prompt Collapse HUI-MIN ZHANG, Washington University in St. Louis, JIAN TAO, Washington University in St. Louis, WAI-MO SUEN, MEW BING WAN, Washington University in St. Louis, RANDY WOLFMEYER, Washington University in St Louis — We performed fully general relativistic simulations of neutron star binary coalescences to investigate how much angular momentum is needed to support the merged system against a prompt gravitational collapse. For a polytropic equation equation of state with the polytropic index in the range of $\Gamma = 2$ to 1.8, we find that the angular momentum threshold for an equal mass system can be described quite accurately by a simple formula $L/M2 = M_{ADM}/M_{ADM}^{max}$, where L is the total angular momentum of the binary neutron star system, M is the total ADM mass of the system, M_{ADM} is the ADM mass of the neutron star in isolation, M_{ADM}^{max} is the maximum ADM mass of a single neutron star with the same equation of state.

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