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Do Gamma-ray Bursts Produce Magnetars? GENEVIEVE SCHROEDER, Northwestern University — Short gamma-ray bursts (SGRBs), which are thought to come from the mergers of binary neutron stars (BNS), may produce massive, rapidly spinning, highly magnetized neutron stars, known as magnetars. These magnetars may deposit a fraction of their rotational energy into the surrounding kilonova ejecta, powering a synchrotron radio signal from the interaction of the ejecta with the circumburst medium. Combining new radio observations with previous studies, we uniformly analyzed 27 low-redshift($z < 0.5$) SGRBs and found that 50% of SGRBs did not form stable magnetar remnants in their mergers. Assuming SGRBs are produced by BNS mergers drawn from the Galactic BNS population plus an additional component of high-mass mergers, we place constraints on the maximum mass of a non-rotating neutron star to be $2.23\,M_{\odot}$. Our methods are complementary to studies in pulsars and gravitational waves which explore the masses that can be achieved for neutron stars.

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