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# Investigating neutron star ULXs as evolutionary precursors to short gamma-ray bursts.

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## Abstract

The dual detection of a short gamma-ray burst (SGRB) (GRB 170817A) (Goldstein et al., 2017) and a gravitational wave (GW) (GW170817) (Abbott et al., 2017) signal marked the first direct confirmation that both phenomena can originate from the same astrophysical event. While the GW and SGRB signals give valuable insights into the properties of the merging neutron stars (NSs), they offer little information about the binary system's evolutionary history prior to merger. This study investigates Ultra-luminous X-ray sources (ULXs) as potential progenitors of SGRBs by examining how super-Eddington accretion onto the primary neutron star influences the binary's evolution before merger. In particular, we explore how this phase of extreme mass transfer affects the magnetic field evolution and spin-up of the neutron star, and how these changes affect the necessary preconditions for SGRB jet launching during the DNS merger.