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On quark deconfinement in the accreting neutron stars of binary-driven hypernovae

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In the binary-driven hypernova (BdHN) scenario, long gamma-ray bursts (GRBs) originate in a binary system composed of a carbon-oxygen (CO) star and a neutron star (NS) companion in close orbit. The collapse of the CO star generates a newborn NS (ν NS) at its center and a type Ic supernova (SN) explosion. Part of the SN ejecta is accreted onto the NS companion and onto the ν NS by fallback. The accretion process occurs at hypercritical (highly super-Eddington) rates, transferring mass and angular momentum to the stars. We here assess whether or not quark deconfinement can occur either in the ν NS or in the NS companion during the hypercritical accretion process.

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