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Effects of modified theories of gravity on neutrino pair annihilation energy deposition near neutron stars

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We present our studies on the neutrino pairs annihilation into electron-positron pairs ($\nu\bar{\nu} \to e^- e^+$) near the surface of a neutron star in the framework of extended theories of gravity. The latter modifies the maximum energy deposition rate near to the photonsphere and it might be several orders of magnitude greater than that computed in the framework of General Relativity. These results provide a rising in the Gamma-Ray Bursts energy emitted from a close binary neutron star system and might be a fingerprint of modified theories of gravity, changing our view of astrophysical phenomena.

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