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Formulating electroweak pion decays in functional methods

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In binary neutron star mergers the dynamical backcoupling of the electroweak interaction to the neutron matter is relevant. To desribe this, a coupled non-perturbative treatment of both sectors is necessary. Functional methods, like Bethe-Salpeter-Equations and the Functional-Renormalization-Group can be used for this purpose. Since the dominant process is beta-decay, a first necessary step is to describe the weak pion decay with these methods. We present how to implement this process in these functional methods, and provide first results of this description.

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