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# Cylindrical wormholes without exotic matter in GR

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All known solutions to the Einstein equations describing rotating cylindrical wormholes lack asymptotic flatness and therefore cannot describe wormhole entrances as local objects in our Universe.To overcome this difficulty, wormhole solutions are joined to flat asymptotic regions at some surfaces $\Sigma_-$ and $\Sigma_+$. The whole configuration thus consists of three regions, the internal one containing a throat and two flat external ones, considered in rotating reference frames. Using a special kind of anisotropic fluid respecting the Weak Energy Condition (WEC) as a source of gravity in the internal region, we show that the parameters of this configuration can be chosen in such a way that matter on both junction surfaces $\Sigma_-$ and $\Sigma_+$ also respects the WEC. It seems to be the first example of regular twice asymptotically flat wormholes without exotic matter and without closed timelike curves, obtained in general relativity.

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