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Resonant decay of gravitational waves into dark energy

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In this talk, I will discuss the decay of gravitational waves (GWs) into dark energy fluctuations $\gamma \rightarrow \pi\pi$ taking into account the large occupation numbers. We study the decay due to the m_3^3 - and \tilde{m}_4^2 -operators in the context of the effective field theory (EFT) of dark energy. It turns out that, in the regime of small GW amplitude corresponding to narrow resonance, the produced waves π feature an instability that grows exponentially. However, once the π non-linearities become important the previous analysis fails to describe the productions. This non-linear effect is relevant for the m_3^3 -operator, while it can be neglected for the \tilde{m}_4^2 -operator.

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