

# Disentangling sources of early matter domination with the gravitaitonal wave spectrum

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An early period of matter domination that suddenly transitions into radiation results in a striking gravitational wave signature. Assuming a given form for the initial power spectrum of curvature fluctuations, one can then do the work to distinguish different sources of early matter domination from features in the spectrum. We first do a model independent analysis where we reduce the features of the spectrum to three time scales - the beginning and end of matter domination and the period of transition. We then do the specific case of comparing a period of Q-ball domination to black holes.

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