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Constrain extra dimensions with shortcuts

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Extra dimensions are expected to solve some long-standing problems in the Standard Model of particle physics. Searching for their traces in our Universe helps to promote our understanding on the physics. Taking advantage of the source property of gravitational waves (GWs), extra dimensions might leave observable effects on GWs. Thus the observation of GWs becomes a new way to probe and study extra dimensions. In the report, we will shortly review the history and viewpoint of extra dimensions, traditional experiments on testing extra dimensions, and some researches on extra dimensions through GWs. We then introduce the conception of shortcuts, which is a new feature of GWs in extra dimensions. Finally, we shall show what we could learn on extra dimensions from detections of GW170817 and its counterpart GRB 170817A.

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