On the parameterized complexity of computing good edge-labelings

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A *good edge-labeling* (gel for short) of a graph G is a function $\lambda : E(G) \rightarrow \mathbb{R}$ such that, for any ordered pair of vertices (x, y) of G, there do not exist two distinct increasing paths from x to y, where "increasing" means that the sequence of labels is non-decreasing. This notion was introduced by Bermond et al. [Theor. Comput. Sci. 2013] motivated by practical applications arising from routing and wavelength assignment problems in optical networks. Prompted by the lack of algorithmic results about the problem of deciding whether an input graph admits a gel, we initiate its study from the viewpoint of parameterized complexity.