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A Note on the Hardness of Graph Diameter Augmentation Problems

The DIAMETER-D AUGMENTATION problem takes as input a graph $G = (V, E)$ and a positive integer k and asks whether there exists a set E_2 of at most k new edges so that the graph $G_2 = (V, E \cup E_2)$ has diameter D. This problem is NP-hard for $D \geq 2$. In this talk, we give a parameterized reduction from DOMINATING SET to DIAMETER-D AUGMENTATION to prove that DIAMETER-D AUGMENTATION is $W[2]$-hard.

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