

1172-13-210

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Rigidity, formality, and syzygies of the module of derivations of a line arrangement. Preliminary report.

We draw a connection between the notion of formality of a line arrangement (introduced by Falk and Randell) and infinitesimal rigidity of a certain graph associated to the arrangement. Using this connection, we produce many new examples of pairs $(\mathcal{A}, \mathcal{A}')$ where \mathcal{A} and \mathcal{A}' have the same intersection lattice but the module of derivations of \mathcal{A} and \mathcal{A}' have different free resolutions. To our knowledge, the only example of this behavior to date is due to Ziegler from 1989 (and certain arrangements obtained by adding lines to his example). This is joint work with Jessica Sidman and Will Traves. (Received August 29, 2021)