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The role of resistivity on line-tying kink modes EVSTATI EVSTATIEV, GIAN LUCA DELZANNO, JOHN FINN, LANL — In a recent paper [1], Evstatiev et al. proposed a new method to analyze the linear stage of line-tied kink modes in cylindrical geometry. The method consists of summing up a number of one-dimensional (radial) eigenfunctions to obtain the full two-dimensional solution of the problem and has been successfully applied to both ideal and resistive MHD [1]. The present work investigates the role of resistivity on line-tied kink modes. Resistivity affects the problem in two ways. First, it disallows perfect line-tying at the two end-plates of the cylinder. Second, some of the radial eigenfunctions used to construct the full solution of the problem can be unstable tearing modes instead of stable ideal modes, thus opening the possibility of tearing-like instabilities in line-tied configurations. In order to address these two issues, we will use our new method to study different equilibria where the field line pitch as a function of radius can be monotonically increasing (tokamak-like), monotonically decreasing (RFP-like) or constant. Furthermore, a parametric study will be presented by varying resistivity and the results will be compared with the ideal MHD case. [1] E. G. Evstatiev, G. L. Delzanno, J. M. Finn, Physics of Plasmas 13, 072902 (2006).

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