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Laboratory evidence that line-tied tension forces can suppress loss-of-equilibrium flux rope eruptions in the solar corona[1] C.E. MYERS, M. YAMADA, E. BELOVA, H. JI, J. YOO, W. FOX, J. JARA-ALMONTE, L. GAO, Princeton Plasma Physics Laboratory — Loss-of-equilibrium mechanisms such as the ideal torus instability [Kliem & Török, *Phys. Rev. Lett.* **96**, 255002 (2006)] are predicted to drive arched flux ropes in the solar corona to erupt. In recent line-tied flux rope experiments conducted in the Magnetic Reconnection Experiment (MRX), however, we find that quasi-statically driven flux ropes remain confined well beyond the predicted torus instability threshold. In order to understand this behavior, *in situ* measurements from a 300 channel 2D magnetic probe array are used to comprehensively analyze the force balance between the external (vacuum) and internal (plasma-generated) magnetic fields. We find that the line-tied tension force—a force that is not included in the basic torus instability theory—plays a major role in preventing eruptions. The dependence of this tension force on various vacuum field and flux rope parameters will be discussed.

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