Abstract Submitted
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Effects of strapping field profiles on plasma loop expansion[1] BAO NGUYEN QUOC HA, PAUL BELLAN, California Institute of Technology — Tokamak-like forces may explain fundamental behaviors of solar plasma arches. The hoop force causes arched, current-carrying plasma loops to expand unless additional forces are applied. This expansion was slowed and even inhibited by a magnetic field of proper polarity in previous solar loop experiments at Caltech [1] but there was no attempt to characterize the strapping field's spatial profile. Kliem and Torok [2] predicted an explosive-like transition from slow expansion to fast eruption if the vertical decay rate of the strapping field exceeds an instability threshold. We have constructed a new set of independently powered auxiliary coils designed to be placed inside the vacuum chamber and closer to the plasma source. The resulting strapping field has a sharper decay rate than with our previous coils and is expected to exceed the instability threshold. Progress on the interaction between arched plasma loops and strapping magnetic fields will be presented.

[1] J. F. Hansen and P. M. Bellan, Astrophys. J. Lett. **563**, L183 (2001)
[2] B. Kliem and T. Torok, Phys. Rev. Lett. **96**, 255002 (2006)

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Bao Nguyen Quoc Ha
California Institute of Technology

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