

Abstract Submitted  
for the 4CF17 Meeting of  
The American Physical Society

**Rapid turn-on time for an electromagnet for use in cold atom and ultracold plasma experiments**<sup>1</sup> PUCHANG JIANG, JOHN GUTHRIE, JACOB ROBERTS, Colorado State University — In many experiments with cold atoms or ultracold plasmas, it is desirable to produce magnetic fields using current-carrying coils so that the field can be precisely tuned and can easily be adjusted in magnitude. Production of larger fields often requires several-turn coils given practical considerations, but the resulting inductance of the coils can lead to limitations on how quickly the magnetic field can be changed. We have developed a technique that allows for a rapid turn-on of the current in such a coil using a large external inductor to produce very large emfs to rapidly change the current in the magnetic-field producing coil. We present measurements of our implementation of this technique and discuss its utility in the context of our planned ultracold plasma experiments.

<sup>1</sup>Supported by the AFOSR

Puchang Jiang  
Colorado State University

Date submitted: 20 Sep 2017

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