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**Spectroscopy of Potassium Rydberg States via Electromagnetically Induced Transparency** WENCHAO XU, BRIAN DEMARCO, University of Illinois at Urbana-Champaign — We perform precision spectroscopy of potassium Rydberg states in a heated vapor cell. The transition frequencies are obtained by observing electromagnetically induced transparency (EIT) features in a two-photon process:  $4S_{1/2} \rightarrow 5P_{3/2} \rightarrow nS_{1/2}$ . We use a velocity selective optical pumping scheme to overcome Doppler broadening, which would suppress the EIT signal since the probe frequency is larger than the coupling frequency. Such precise spectroscopy will enable novel experiments with Rydberg-dressed ultracold Fermi gases.

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