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Photodetachment Spectroscopy Of Evaporatively Cooled Negative Ions[1] JOHN N. YUKICH, JAMES E. WELLS, Davidson College — Spectroscopic resolution of photodetachment from negative ions is limited by thermal broadening phenomena such as the Doppler and the motional Stark effects. To reduce this broadening the ions may be evaporatively cooled. Our experimental apparatus includes a Penning ion trap in which negative ions are created, trapped, and stored. Numerical models show that evaporative cooling, producing a lower average ion temperature, will enhance resolution of photodetachment spectroscopy. We present preliminary evidence of this cooling effect.

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