

Abstract Submitted
for the DAMOP11 Meeting of
The American Physical Society

Towards Doppler cooling of SiO⁺ JASON HIEU VAN NGUYEN, DAVID TABOR, BRIAN ODOM, Northwestern University — Extending the techniques of Doppler cooling from atoms to molecules is challenging due to the complex nature of molecular structure. Rotation and vibration of the molecule result in additional dark states which may require repumping, and higher order processes such as photodissociation and predissociation may terminate the cycling transition. We identify SiO⁺ as a promising candidate for laser cooling, which differs from previous candidates in that the cycling scheme involves three electronic states. Using a rate-equation approach, we model the cooling process and find that the intervening electronic state does not require additional repumping, since decay out of it is sufficiently fast. We also present our current efforts towards Doppler cooling of SiO⁺.

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Date submitted: 31 Jan 2011

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