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Progress In Doppler Cooling of SiO^{+}[1] JASON NGUYEN, DAVID TABOR, MARC BOURGEOIS, BRIAN ODOM, Northwestern University — The rich internal structure which makes molecular ions interesting is exactly what makes them difficult to Doppler cool. Rotation and vibration within the molecule results in additional dark states which require repumping, and higher-order processes such as photodissociation and predissociation may terminate the cycling transition. We have identified SiO^{+} as a promising candidate for laser cooling, and we present our current experimental progress towards cooling both the external and internal degrees of freedom.

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