**Experimental Progress in Laser-Cooling Molecules**\(^1\) MICHAEL DI ROSA, ALEXEI TONYUSHKIN, Los Alamos National Laboratory — At Los Alamos National Laboratory, we are studying a particular class of diatomics – the alkaline-earth monohydrides (e.g. BeH and CaH) – that have Rydberg transitions similar to the \( ^2P_{1/2,3/2} \rightarrow ^2S_{1/2} \) transitions of alkali atoms and appear suited to laser cooling. As a class, the \( A \rightarrow X \) transitions of the alkaline-earth monohydrides possess characteristics that are favorable for Doppler-cooling, including a (nearly) diagonal Franck-Condon array and good spectral isolation of the transitions that form the cooling cycle. We will show how a beam of such molecules can be laser cooled and report the status of our experiments for the particular case of CaH.

\(^1\)Los Alamos National Laboratory LDRD, Army Research Office