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A Rb D1 MOT for Simulating a SrF MOT[1] ERIC NORRGARD, TOSHIHIKO SHIMASAKI, JOHN BARRY, COLIN BRUZEWICZ, MATT STEINECKER, DAVID DEMILLE, Yale University — Our group recently demonstrated transverse laser cooling and longitudinal laser slowing of a buffer-gas-cooled beam of polar molecules (SrF). Work is underway to load these slow molecules into a magneto-optical trap (MOT). A SrF molecular MOT presents a number of complications not present in a usual alkali MOT. The standard MOT design uses a cycling transition on the D2 line of an alkali. The level structure of SrF precludes the use of a true two-level cycling transition; instead, due to the existence of dark Zeeman sublevels, it is at first glance unclear whether a net trapping force can be applied. However, a closely analogous situation occurs in an alkali D1-line MOT, which has been experimentally demonstrated to be effective despite this level structure. This poster details ongoing investigations of a Rb D1 MOT, intended to better understand effects associated with this nonstandard level structure on the behavior of a MOT design, in particular when applied to SrF.

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