

Abstract Submitted
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Reflectance of mirrors exposed to a strontium beam JOHN HUCKANS, Bloomsburg University of Pennsylvania, MAXIM OLSHANII, University of Massachusetts Boston — The chemical reactivity of strontium, which opacifies vacuum viewports exposed to strontium sources, is a concern for atomic physics experiments where a laser beam counter-propagates relative to a strontium beam. Some experiments use heated sapphire viewports to reduce strontium deposition. Here, we study another approach wherein the laser beam counter-propagates after first reflecting off an in-vacuum mirror at 45° exposed to the strontium flux. We show that an SiO₂-protected reflective surface is a solution for strontium depositions up to 1.5m. A reaction with SiO₂ creates a transparent film, maintaining the back surface reflectivity. Deposition on inert sapphire results in much lower reflectance. Our results provide guidance for Zeeman-decelerated strontium experiments, and an alternative to heated sapphire viewports. We provide flux-dependent viability estimates.

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