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Performance of Optimized Ternary Coatings at Ambient and Cryo Temperatures

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The structure of ternary coatings featuring minimum thermal (Brownian) noise under prescribed transmittance and absorbance constraints is investigated and found to consist of a few tapered quasi-Bragg triplets on top of an almost fixed-thickness stack of quasi Bragg doublets using the highest contrast material pair. The noise reduction of coatings based on aSi, $\text{TiO}_2\text{:Ta}_2\text{O}_5$ and SiO_2 as well as SiN_x , $\text{TiO}_2\text{:Ta}_2\text{O}_5$ and SiO_2 at 290K, 120K and 20K is evaluated by comparison with alternative recipes.

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