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Use of Plasma Enhanced ALD to Construct Efficient Interference Filters for Astronomy in the FUV[1] PAUL SCOWEN, Arizona State Univ — Over the past few years the advent of atomic layer deposition (ALD) technology has opened new capabilities to the field of coatings deposition for use in optical elements. At the same time, there have been major advances in both optical designs and detector technologies that can provide orders of magnitude improvement in throughput in the far ultraviolet (FUV) and near ultraviolet (NUV) passbands for use in observational astronomy. Recent review work has shown that a veritable revolution is about to happen in astronomical diagnostic work for targets ranging from protostellar and protoplanetary systems, to the intergalactic medium that feeds gas supplies for galactic star formation, and supernovae and hot gas from star forming regions that determine galaxy formation feedback, to the most distant of objects in the early universe. These diagnostics are rooted in access to a forest of emission and absorption lines in the ultraviolet (UV), and all that prevents this advance is the lack of throughput in such systems, even in space-based conditions. We describe our program that has been designed to use a range of materials to implement stable optical layers suitable for protective overcoats with high UV reflectivity and unprecedented uniformity, and use that capability to leverage innovative ultraviolet/optical filter construction to enable the type of science described above.

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