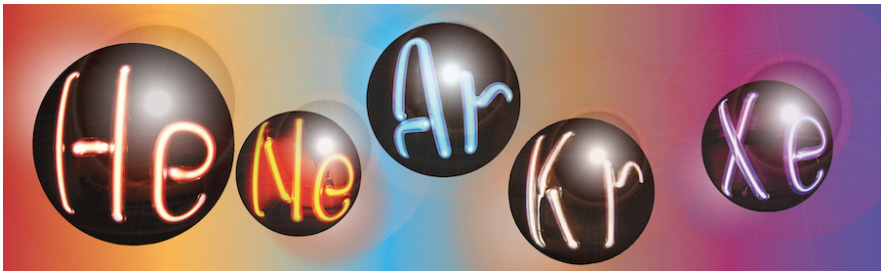

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MagLITe - a multi-layer approach to wavelength shifter thin films

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Many photodetection systems of liquid noble experiments are comprised of an external wavelength shifter film, deposited over an optical element. Although this technique has many advantages, the expose external wavelength shifter is delicate and is subjected to problems, for instance, cross-contamination, mechanical and chemical stresses, and photobleaching. To help with these drawbacks, our group developed MagLITe (Magnesium fluoride Light collection Improvement technique). This technique consists in covering the external wavelength shifter with a layer of a material that is transparent to VUV light, while also being hard, durable, and compatible with the underlying layer. By carefully designing the top layer, MagLITe is not only able to solve the described drawbacks but also acts as an anti-reflective coating, significantly increasing the efficiency.
In this work, we will discuss the in-depth concept of this technique, measurements of key parameters, and the first result of this new multi-layer implementation.

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