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Development of a 20cm-by-20cm ”hot” indium-alloy hermetic seal in an inert atmosphere for photo-detector assembly

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The Large-Area Picosecond Photo-Detector Collaboration (LAPPD) is currently developing a large-area, modular photo-detector system composed of thin, planar, glass-body modules, each with two 20x20-cm-squared ALD-functionalized MCPs in a chevron geometry. In the case of LAPPD, hermetic sealing between the entrance window and the detector body is complicated by the square shape of the detector and the large area. We have successfully demonstrated a technique to make a vacuum seal for the LAPPD detectors by using an indium-alloy above its melting temperature on a flat pre-coated glass surface in an inert atmosphere. While this technique has been developed in a glove box filled with an inert gas, it can be adapted for the use in a vacuum transfer assembly process.

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