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Electromagnetic bench testing of ALS-U BPM buttons and assemblies

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The ALS Upgrade Project (ALS-U) consists in the replacement of the existing ALS storage ring and the addition of a new accumulator ring in order to decrease the horizontal beam emittance to about $70 \text{ pm} \cdot \text{rad}$, resulting in an increase of two orders of magnitude in the soft X-Ray brightness. The vacuum chambers of two new rings, and of the transfer lines connecting them, will include 327 new beam position monitors (BPM). The design of these BPM is now largely completed and relies on the procurement of about 1,500 BPM buttons (including spares and prototypes) from commercial suppliers and their installation on the BPM chamber enclosures. Our design includes more than a dozen different BPM designs and almost as many different buttons. All the buttons, as well as the assembled BPM, have to undergo vacuum and RF testing to characterize them and detect defective units before their installation. In this paper, we describe our electromagnetic testing plan and report on the results covering the entire button production for the accumulator ring and the prototypes for the storage ring, as well as the electromagnetic measurement for the assembled ALS-U Accumulator Ring (AR) BPMs.

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