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Search for Low Mass Dark Photons at the Belle II Experiment

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The Belle II experiment is operating at the SuperKEKB asymmetric energy electron-positron collider and has accumulated a collision data of 424/fb. This presentation focuses on the search for the dark photon at Belle II. The dark photon is a hypothetical particle that is proposed to serve as a mediator between the Standard Model and dark matter. We search for the production of a dark photon accompanied by an energetic initial state radiation photon. Specialized low multiplicity triggers have been active for the entire Belle II dataset to target this detector signature. In light of the X17 anomaly reported by the ATOMKI collaboration, we focus on a low-mass dark photon decaying into electron and positron pair within the Belle II detector. One of the challenges in this analysis is the background from photon conversion in detector material, which can mimic a dark photon decay. I will present the current progress of this analysis and our technique to validate the converted photon background predictions.

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