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# Improved Standard-Model Prediction for $0 \rightarrow \pi^+ \pi^-$ and Constraints on BSM Physics

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We present the recent work on an improved Standard-Model prediction for the rare decay  $\pi^0 \rightarrow ^+e^-$ , which plays a crucial role in the test of the long-distance dynamics of the strong interaction. The reduced amplitude of the decay is determined by the pion transition form factor for  $\pi^0 \rightarrow \gamma^* \gamma^*$ , for which we employ a dispersive representation that incorporates both time-like and space-like data as well as short-distance constraints. The resulting SM branching fraction,  $\text{Br}[\pi^0 \rightarrow ^+e^-] = 6.25(3) \times 10^{-8}$ , reveals a ten-fold improvement in precision over experiment and sharpens constraints on physics beyond the Standard Model.

**Primary author:** HOID, Bai-Long

**Co-authors:** HOFERICHTER, Martin (University of Bern); KUBIS, Bastian; LÜDTKE, Jan

**Presenter:** HOID, Bai-Long

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