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Resonant Soft X-ray Scattering Study on Multiferroic $TbMnO_3$
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$TbMnO_3$ has been extensively studied both experimentally and theoretically about its fascinating properties (e.g., magneto-electric coupling, spiral magnetic order). Comprehensive resonant x-ray scattering at absorption edges of Mn and Tb, mainly at Mn *L*-edge, were performed on single crystals of $TbMnO_3$ to understand the fascinating properties. Under *Pbnm* space group of $TbMnO_3$, we found the forbidden reflections, such as (0 q 0), (0 1-2q 0), and (0 2q 0). Each reflection was also investigated by dependency on temperature, photon energy, photon polarization, and etc, which gives us a clue to unveil hidden properties of $TbMnO_3$. Detailed description will be dealt with this presentation.

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