

Abstract Submitted  
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**Topological defects at octahedral tilting plethora in bi-layered perovskites<sup>1</sup>** SANG-WOOK CHEONG, FEI-TING HUANG, BIN CAO, JAE-WOOK KIM, Rutgers Univ, XUAN LUO, Postech, YAZHONG WANG, Rutgers Univ, MING-WON CHU, National Taiwan University, CK CHANG, HS SHEN, National Synchrotron Radiation Research Center, Hsinchu — Oxygen octahedral distortions including tilts/rotations, deformations and off-centering in (layered) perovskites play the key role in their numerous functional properties. Near the polar-centrosymmetric phase boundary in bi-layered perovskite  $\text{Ca}_{3-x}\text{Sr}_x\text{Ti}_2\text{O}_7$  with  $x \approx 1$ , we found the presence of abundant topological eight-state vortex-antivortex pairs, associated with four oxygen octahedral tilts at domains and another four different oxygen octahedral tilts at domain walls. The inter-relationship between this unique structural domain topology and magnetic domains with canted magnetic moments in related compounds will be presented. In addition, we will discuss the general topological classification scheme of the connectivity of domains and domain walls.

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