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Robustness of the insulating band structure of BaBiO3 films in the ultrathin limit MUNTASER NAAMNEH, Swiss Light Source, Paul Scherrer Institut, CH-5232 Villigen-PSI, Switzerland, DARIUSZ GAWRYLUK, TIAN SHANG, Laboratory for Scientific Developments and Novel Materials, Paul Scherrer Institut, CH-5232 Villigen PSI, Switzerland, DANIEL MCNALLY, JOL MESOT , MING SHI, MILAN RADOVIC, NICHOLAS PLUMB, Swiss Light Source, Paul Scherrer Institut, CH-5232 Villigen-PSI, Switzerland — BaBiO3 is a fully-gapped charge density wave (CDW) insulator at all temperatures, due to a 3D static breathing distortion of the BiO6 octahedra – essentially a frozen lattice of polarons. With hole doping, it becomes a 30 K superconductor. At the same time, the static distortions vanish, though fluctuations could conceivably persist and play a role in superconductivity. Hence, trying to perturb the CDW order is an appealing route to gain new insights into the nature of the unusual insulating phase and the interactions at play in bismuthate high-Tc superconductivity. With this in mind, we have performed ARPES on BaBiO3 films as a function of thickness. The measured band structure shows that BaBiO3 can remain crystalline and insulating down to surprisingly low thickness, where one might otherwise have expected a breakdown of the 3D CDW. The results give a new perspective on the relative influence of long-range Peierls interactions and short-range "bond disproportionation" phenomena in this class of materials.

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