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Geometry Conditions Affecting Piezoresponse Force Microscopy FRANK PETER, BERND REICHENBERG, ANDREAS RÜDIGER, KRZYSZTOF SZOT, RAINER WASER — Piezoresponse force microscopy provides valuable insight into the inverse lateral and vertical piezoelectric effect on the nanoscale. When examining ferroelectric grains as opposed to continuous thin films, the measured response is substantially influenced by the topography. Furthermore, a lateral piezoresponse exists in axially symmetric samples. An analysis of the piezoelectric tensor of the material and the radially symmetric electric field applied by the cantilever shows that the lateral as well as the vertical piezoresponse depends on more than one piezoelectric coefficient. This results in an increase of the unexpected lateral response near the perimeter of a grain. Due to the geometry of the cantilever this enhancement is only visible on certain sides of a grain. As a result of a mechanical crosstalk, a part of the lateral signal at the cantilever can be observed in the vertical response.

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