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Magnetic and Crystal Structures in $LaVO_3$ Thin Films under Epitaxial Strain HUGO MELEY, JEAN MARC TRISCONE, STEFANO GARIGLIO, DQMP - University of Geneva — Interplay between spin, charge, orbital and lattice degrees of freedom is extremely strong and at the origin of numerous phenomena in complex oxides [1]. A remarkable case of lattice-orbit coupling is the Jahn-Teller (JT) effect. $LaVO_3$, a $3d^2$ compound, exhibits a JT-type cooperative distortion below the 140 K structural phase transition where a mixed G- and C-type orbital order establishes [2]; at higher temperatures, the crystal field due to $GdFeO_3$-type distortion (Pbnm symmetry) imposes a C-type orbital ordering, although with strong orbital fluctuations [3]. We have explored the effect of biaxial strain in epitaxial thin films of $LaVO_3$. X-ray diffraction reveals that the layers accommodate the strain imposed by the substrate assuming different patterns of octahedral tilts and rotations. We used temperature dependent X-ray diffraction, muon spectroscopy and optical conductivity to investigate the film structure under different strain states as well as the orbital and magnetic order. We compare these results with calculations from ab−initio theory.

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