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Casimir interactions between cold atoms and corrugated surfaces DIEGO A.R. DALVIT, Los Alamos National Laboratory, PAULO A. MAIA NETO, Federal University of Rio de Janeiro, Brazil, ASTRID LAMBRECHT, SERGE REY-NAUD, CNRS and Kastler Brossel Laboratory, France — The lateral Casimir-Polder force between an atom and a corrugated surface should allow the experimental study of non trivial geometrical effects in quantum vacuum. We apply the scattering approach to compute this force for an atom (or a BEC) above a corrugated surface, and compare our exact results with two commonly used approximations, the proximity approximation and the pairwise summation technique. We show that large corrections to these approximations could be measured using present-day technology with a BEC used as a vacuum field sensor. For details, see D.A.R. Dalvit et al, arXiv:0710.5249, 0709:2095.

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