

Abstract Submitted  
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**Nano-ripple Formation on TiO<sub>2</sub>(110) by Grazing Incidence Low Energy Ion Beams** TIM LUTTRELL, University of South Florida, WEI-KUN LI, XUE-QING GONG, East China University of Science and Technology, MATTHIAS BATZILL, University of South Florida — Structure formation due to surface sputtering by grazing incident ion beams is investigated by scanning tunneling microscopy. Higher local sputter yield at monoatomic step edges compared to atomically flat terraces causes preferential erosion of step edges. This results in the destruction of step edges normal to the ion beam and consequently a preferential alignment of step edges along the azimuthal direction of the ion beam. We show that this kinetic method allows the preparation of high-energy step edges that are thermodynamically unstable. In addition for long irradiation times the surface self organizes in a nano-ripple structure with ripple-alignment in the ion beam direction. Studying the surface evolution as a function of ion fluence enables us to extract information of local sputter yields at step edges and terraces. This information will form the basis for the analysis of the mechanisms that give rise to the surface structuring by grazing, low energy ion beams.

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