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Aeolian sand ripples: experimental study of fully developped states

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We report an experimental investigation of aeolian sand ripples, performed both in a wind tunnel and on stoss slopes of dunes. Starting from a flat bed, we can identify three regimes: appearance of an initial wavelength, coarsening of the pattern and finally saturation of the ripples. We show that both initial and final wavelengths, as well as the propagative speed of the ripples, are linear functions of the wind velocity. Investigating the evolution of an initially corrugated bed, we exhibit non-linear stable solutions for a finite range of wavelengths, which demonstrates the existence of a saturation in amplitude. These results contradict most of the models.