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Temporal behavior of topographic wave-breaking OLIVIER EIFF, Université de Toulouse, IMFT, NICOLAS BOULANGER, CNRM; CNRS-GAME, KARINE LEROUX, Université de Toulouse, IMFT, ALEXANDRE PACI, CNRM; CNRS-GAME — At low Froude numbers, the internal waves generated by flow over an obstacle or mountain will overturn and break. In the atmosphere, this results in high altitude clear air turbulence but also affects the flow field below, the most commonly known effect being the acceleration the downslope winds. Surprisingly litte is known, however, of the dynamics of the wave breaking itself. Afanasyev and Peltier (JAS, vol. 55, 1998) investigated the wave breaking region via LES and Eiff et al. (DAO, vol. 40, 2005) via PIV measurements, but both presumed a statistically stationary wave-breaking process after the initial wave overturning. Here, we propose to take a closer look at this assumption by closely analyzing the spatio-temporal structure of internal wave breaking region and the surrounding flow. The analysis is based on Hovmöller diagrams and spatial correlations obtained from 2D-PIV measurements of flows generated in uniform stratified flow over 2D and quasi-2D obstacles in salt-stratified hydraulic channels at different Reynolds numbers ranging from laminar to turbulent. The results reveal low frequency variations throughout the flow field, in and outside the wave-breaking region. This characteristic frequency can be related to be due to a sequence of growth and decay of wave-breaking.

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