

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Fragmentation in brittle rods NICOLAS VANDENBERGHE, ROMAIN VERMOREL, EMMANUEL VILLERMAUX¹, IRPHE, Aix-Marseille Université — When a rod made of brittle material is axially impacted it breaks into fragments of various sizes. Before the first breaking event, an axial compression wave propagates along the rod, triggering a buckling instability. The instability selects a transverse mode with a well defined wavelength. Recently, Gladden et al. have shown that the fragment size distribution exhibits two peaks corresponding to the length selected by the buckling instability. In the present work we explore in more details the dynamics of elastic waves in the rod and the different phenomena that may explain the broad distribution of fragment sizes. In particular, we will discuss the coupling between the longitudinal and the transverse displacement in the post buckling dynamics.

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Date submitted: 27 Dec 2006

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