

Abstract Submitted
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Blast wave mitigation by liquid foam¹ MARTIN MONLOUBOU, BENJAMIN DOLLET, ARNAUD SAINT-JALMES, ISABELLE CANTAT, Institut de Physique de Rennes, SOFT MATTER TEAM — Due to their high apparent viscosity, liquid foams are good systems to absorb energy. This property is for instance used in the military domain to mitigate blast waves or explosions [Britan, 2009; Del Prete, 2013]. However, the underlying dissipation mechanisms are still not well understood. We address this issue by resolving in space and time a shock wave impacting a foam sample. We use a shock tube to send a shock wave on a foam with controlled liquid fraction, bubble size and physico-chemistry. The impacting shock creates an expanding cavity in the foam and propagates through the whole sample. The dynamics is recorded with a high speed camera and pressure signals are simultaneously measured. We show the influence of the bubble size and of the shock amplitude on the velocity and on the attenuation of the pressure signal, and on the foam destruction rate.

[1] Britan et al., *Colloids and Surfaces A*, 344:48-55, 2009.

[2] Del Prete et al., *Shock Waves*, 23:39-53, 2013.

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