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**High energy concentration in gas by shock focusing** VERONICA ELIASSON, NICHOLAS APAZIDIS, NILS TILLMARK, KTH Mechanics, 100 44 Stockholm — The purpose of the present work is to study how the shape of a converging shock wave influences the stability and shock dynamics during the focusing and reflection process. Experiments are performed in a horizontal shock tube where a plane shock is transformed into an annular shape and then focused in a cylindrical test section. The shock wave is formed into different geometrical shapes by two separate methods. In the first method the desired shock shape is achieved by changing the shape of the outer boundary of the test section. In the second method cylindrical obstacles are placed at different positions and patterns inside the test section. Disturbances from the obstacles affect the shock and change its shape. During the focusing process the shock undergoes a successive change in shape. The coupling between the local strength of the shock and the shape of the shock front makes regions with higher curvature (i.e. corners) travel faster than regions with lower curvature (i.e. plane sides). Our results show that circular shock waves are unstable and hence easy to perturb while polygonal shock waves are stable. An interesting phenomenon, which occurs during the later stages of the focusing process, is the emission of light. The intensity of the emitted light depends on the gas used in the test section and on the shape and regularity of the shock wave. A symmetric shape (e.g. a square) emits more light than a non-symmetric shape (e.g. a shock wave disturbed by only one cylinder).

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