effort will be directed toward the use of electromagnetic velocity gauges[12] and laser interferometry.[13] Some preliminary studies of the latter methods have already been made.

The research problems fall into two major categories -- phase transitions and constitutive relations. The work on phase changes is directed to the study of some heretofore poorly understood transitions, and to the development of the mixture technique reported by Dremin[14] for minimizing stress anisotropy. Particular interest is in the kinetics of these solid-solid transitions.

The study of constitutive relations is directed toward an improved understanding of dynamic yielding in single crystals of measurable dislocation densities.

The individual research problems currently under investigation are outlined below.

A. Cadmium Sulfide (CdS)

CdS is known to undergo a phase transformation at a static pressure of 27 kbar.[15] This transformation from a wurtzite to a rocksalt structure is accompanied by a 19% change in specific volume. Kennedy and Benedick[16] report this transition under shock loading conditions at 31.5 kbar and 28 kbar respectively in single crystals shock-loaded parallel to the c-crystal axis and perpendicular to it. They base their findings on an observed double wave structure and on the calculated change in specific volume. However, the elastic waves in CdS single crystals (42 kbar for the c-axis and 21 kbar perpendicular to it) will themselves give rise to a double wave structure. There is thus some uncertaintly whether the observed two-wave structure is due to the phase change.

The purpose of the present work is to reduce the elastic limit essentially to zero so that shock experiments will yield essentially hydrostatic pressure-volume data. A technique similar to that employed by