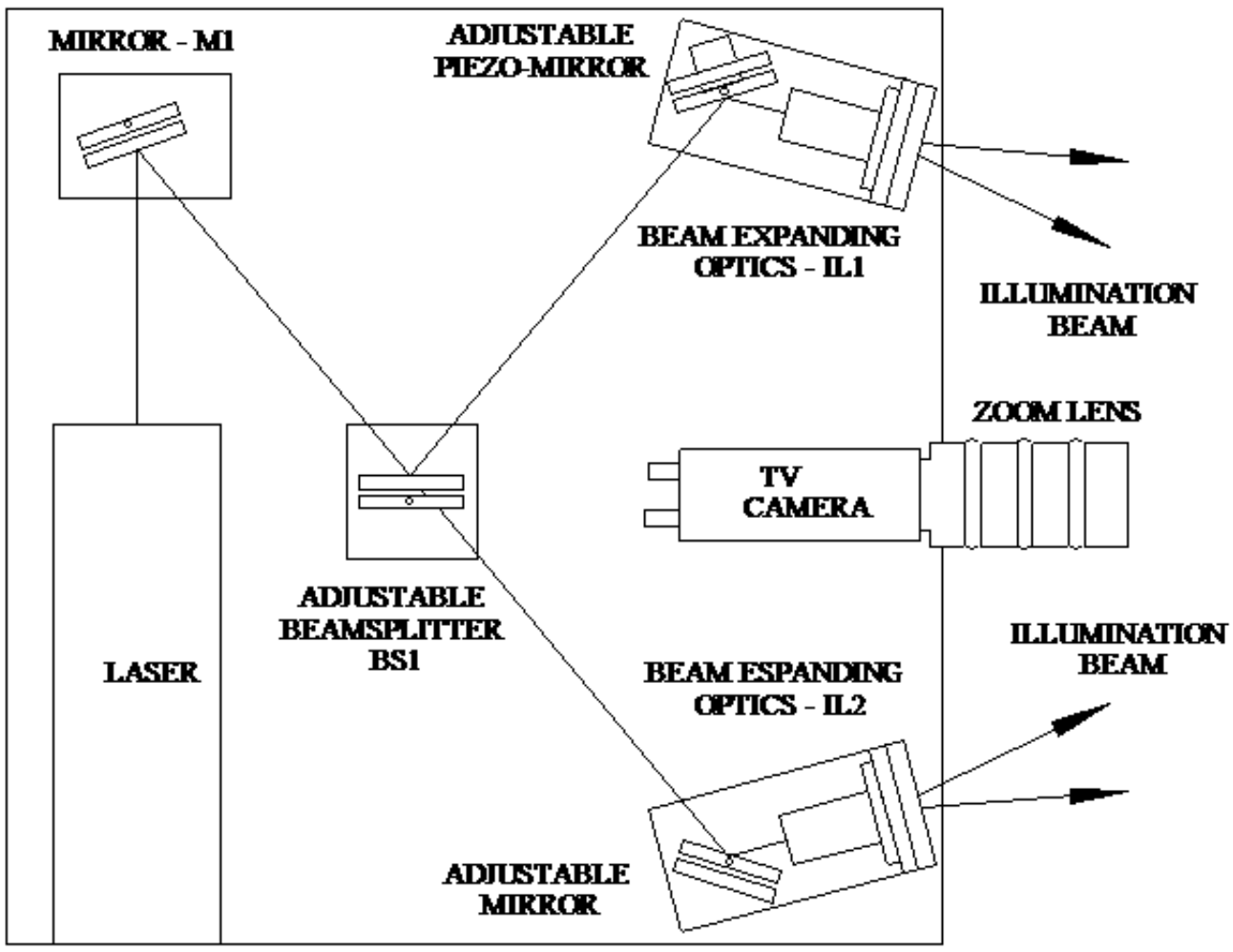
Speckle Correlation



This diagram illustrates the modular design of the Electronic Speckle Correlation optical head mounted on an 18-inch square pallet. It is composed of 5 small modules, which manipulate the laser beam and divide it into two illumination beams that illuminate the object from two equal and opposite angles.

The illumination angles are adjustable, depending on the size of the object, from ±5° to ±30°. The TV camera records the sum of the two fields that are reflected by the object, each corresponding to its respective illumination beam. The mirror in one of the illumination beams is piezoelectrically actuated to step the phase of that beam by 90° between TV frames, and this modulates the interference of the two fields at the camera in the proper way to provide input to the HoloFringe300 interferometry program. This configuration is sensitive only to horizontal translations of the object at right angles to the bisector of the two illumination beams. It is the ideal interferometer for measurement of strain on a flat surface, or for measurement of transverse vibration.