Development of an Aspherical Bimorph PZT Mirror Bender with Thin Film Resistor Electrode

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Abstract

A bimorph PZT mirror bender was designed for active optics. The bender was constructed with two pairs of Si and PZT plates, and was glue bonded in a Si-PZT-PZT-Si structure. Each PZT was coated with one layer of Ag thin film as the ground electrode and one layer of TiN thin film as the control electrode. The TiN film performs as a resistor layer and different voltages can be applied on both sides to distribute linearly the voltage difference. When interacting with the ground electrode, an adjustable third-order polynomial surface profile can be achieved. A rigid holder was also constructed to provide firm support and constrain the deflection of the center part of the bender to within 5 μm. This article presents the fabrication processes and the testing results.

Keywords: bimorph PZT, mirror bender, thin film, TiN, electrode

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