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Waveguide Characterization Using Shear Force Scanning Optical Microscopy. RONGJIN YAN, G. YUAN, R. POWNALL, K. LEAR, Elec. & Comp. Engr. Dept. Colorado State University — Waveguide characterization is an essential task in the development of photonic integrated circuits for a variety of applications, including biosensors and next generation optical interconnects. A shear force SOM (scanning optical microscope) is being developed for characterizing waveguide evanescent fields as well as scattered light in both the near field and the far field. These methods correspond to photon scanning tunneling microscopy, proximity scanning optical microscopy, and scatter imaging, respectively. Shear force feedback eliminates noise due to scattered light introduced by a second light source required for conventional optical feedback systems based on reflective cantilevers. Additionally, the shear force feedback configuration simplifies raster scanning of the probe rather than the sample allowing easier coupling to multiple waveguides on the sample. The distribution of scattered light intensity can be correlated with features in the evanescent fields that may prove useful for waveguide sensors.

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