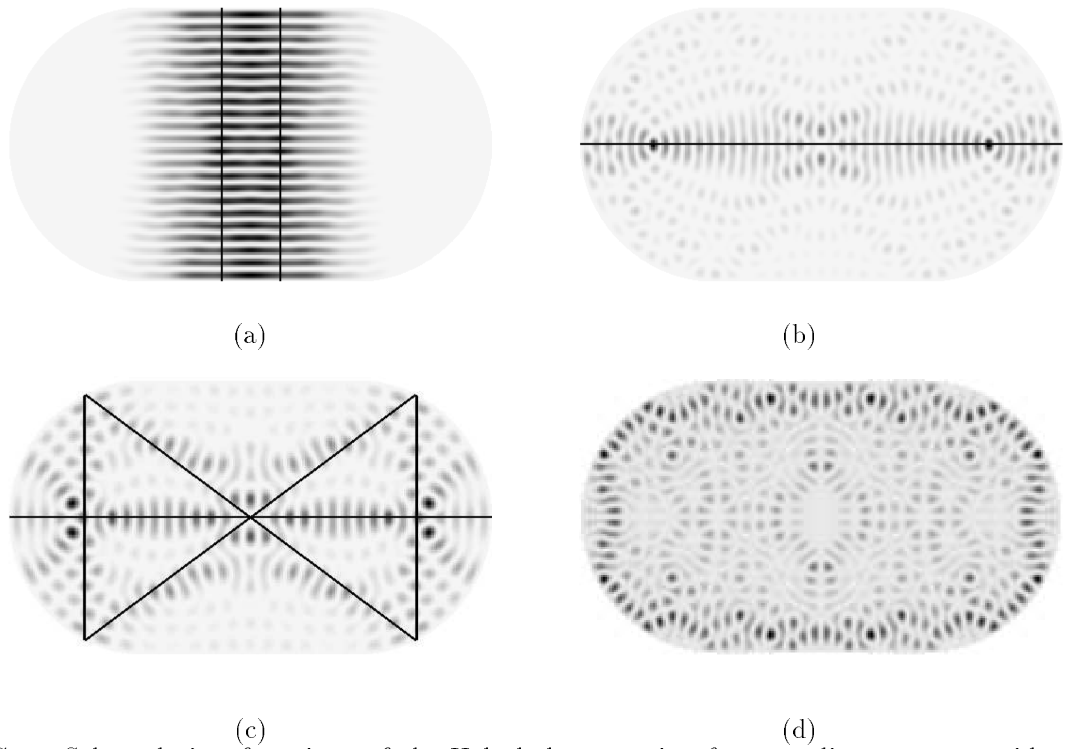

FIG. 3. Selected eigenfunctions of the Helmholtz equation for a stadium geometry identical to that used in the experiments. Wavenumbers are chosen to be in the range explored experimentally. (a) Bouncing ball mode; (b) horizontal mode; (c) bowtie mode; (d) whispering gallery mode. A large proportion of the experimental patterns are similar to the first three eigenfunctions that are scarred by periodic orbits (shown by lines) of the corresponding ray system. However eigenstates such as the whispering gallery mode (d) are not observed in the experiments.