

EFFECTS OF AN ELLIPTIC RIDGE
ON WAVES OF TIDAL FREQUENCY

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ABSTRACT

A numerical finite difference model using the Laplace Tidal Equations on an f -plane was developed to predict how tidal motion is disturbed by an elliptic ridge. A nonreflective open ocean boundary condition was developed for the scattered wave. The model was verified by comparison with a newly derived solution for a cylindrical elliptic island on a flat-bottomed ocean. With published tidal data for the Hawaiian Ridge, a least squares fit gave a fair determination of the tidal elevation throughout the ridge and indicated that the ridge west of Kauai is unimportant in distorting the tides.