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Exact result for the grazing angle of specular reflection from a sphere. (English)

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SIAM Rev. 35, No. 3, 472-480 (1993).

The determination of the specular angle is an important consideration in the design of radar by ray tracing methods. This angle is easily determined for a flat surface. However, the problem is more difficult for a sphere where numerical procedures exist – but no exact formula was known. The authors derive an exact formula for spherical specular reflection by displaying the grazing angle as one of four roots of a self-inversive quartic polynomial that arises from the geometry of the reflection.

Reviewer: P.A.McCoy (Annapolis)

MSC:

30C15 Zeros of polynomials, rational functions, and other analytic functions of one complex variable (e.g., zeros of functions with bounded Dirichlet integral)

Cited in 1 Document

Keywords:

Cardan method; self-inversive polynomials; roots of quartics; Ferrari method; spherical specular reflection

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