

**Miller, Allen R.; Vegh, Emanuel**

**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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