The Doppler Effect for Scattering by Plane Boundaries at Normal Incidence

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Recently Cooper [1], and Van Bladel and De Zutter [2] analyzed the one-dimensional scattering problem involving a velocity dependent boundary. The simple example of the harmonically vibrating boundary has been considered in detail. It appears that the authors were unaware of existing work by the author of the present note [3], which includes the De Smedt construct employed by Van Bladel and De Zutter [2]. In the interest of obviating future repetition and duplication, it seems worthwhile to call the attention of readers to earlier results [3] and related studies [4]-[7].

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Reply by J. Van Bladel and D. De Zutter[1,2]

The authors thank Dr. Censor for having brought his Franklin Institute article to their attention. Dr. Censor's article contains, indeed, the "De Smedt construct," presented in Section 5, as a check on the general theory.

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Comments on the Bojarski Identity

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The following is my understanding of the contributions made by Norbert N. Bojarski to the field of inverse scattering, and I regret any prior misinterpretations and/or misaccreditions with regard thereto.

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Based on the physical optics approximation

$$\phi = \begin{cases} 2\phi_i, \\ 0 \end{cases} \quad \bar{k} = \begin{cases} 2\hat{n} \times \bar{H}_i, & \text{illuminated side} \\ 0, & \text{shadow side.} \end{cases} \tag{1}$$

Bojarski is the originator of the physical optics inverse scattering identity [1]

$$\gamma(\bar{x}) = (2\pi)^{-3/2} \iiint e^{-2i\bar{k}\cdot\bar{x}} \Gamma(\bar{k})\, d^3k, \tag{2}$$

also known as the Bojarski or POFFIS identity. He is also the originator of the time domain formulation of this identity [1], the integral equation for incomplete information [2] for this identity

$$a(\bar{x}) * \gamma(\bar{x}) = (2\pi)^{-3/2} \iiint_A e^{-2i\bar{k}\circ\bar{x}} \Gamma(\bar{k})\, d^3k, \tag{3}$$

and the analytic closed form high frequency solution [2]

$$\chi(\bar{x}) = (2\pi)^{-3/2} \iiint_A e^{-2i\bar{k}\cdot\bar{x}} ik_3 \Gamma(\bar{k})\, d^3k,$$

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Correction to "A Systematic Design Formulation for Butler Matrix Applied FFT Algorithm"

MOTOHARU UENO

In the above paper[1] the first line of (12a) on p. 498 should read

$$a_{i_1 0,m}{}^{(2)} = a_{i_1,m}{}^{(1)} + [j]\,\alpha_{i_1 i_2}{}^{(2)} a_{i_1,m+M_2}{}^{(1)}.$$

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[1] M. Ueno, *IEEE Trans. Antennas Propagat.*, vol. AP-29, no. 3, pp. 496–501, May 1981.