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Metal and Nonmetal Protective Screens for Hypervelocity Debris Shielding

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Abstract. The protective properties of metallic and nonmetallic screens were experimentally investigated when penetrated by an aluminum shaped charge jet at collision velocities of 7–10 km/s. Such a projectile is an analog of an elongated fragment of man-made debris. For materials of protective screens, we used glass, B4C ceramics, and diamond-silicon carbide ceramic composite. The obtained results were compared with the data obtained for metal screens. In this paper, we show that the effectiveness of screen protection increases due to phase and structural transitions that occur during the interaction of elongated hypervelocity projectile with protective screens.

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