

Composite Interference Performance of Chopped Carbon Fiber Clouds to Millimeter Wave and Infrared

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Abstract: To study the composite interference performance of chopped carbon fiber (CF) clouds to millimeter wave and infrared, the test platform was built. The 1.5 mm and 4 mm CF explosion dispersion experiments were carried out under the static wind condition. The process of forming explosion dispersion clouds was investigated. The interference performance of clouds to 3 mm wave, 8 mm wave and 8–14 μm infrared was measured and analyzed. The results show that chopped CF can be effectively dispersed by explosion, and the stable smoke clouds can be formed under the conditions of experimental bomb structure and loading parameters, revealing an excellent composite interference performance to the millimeter wave and infrared. The maximum attenuation to the millimeter wave and infrared is more than 95%. The effective effect time to 3 mm wave (one-way attenuation decibels ≥ 5.2 dB) is not less than 1 min, and the time to 8 mm wave can reach more than 30 s. The effective obscuring time to infrared target (attenuation rate $\geq 85\%$) is more than 20 s, and the change in CF length has a significant effect on the millimeter wave interference performance.

Key words: chopped CF; clouds; millimeter wave; infrared; interference

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