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The AMRDEC Process for Analyzing Initiation Effectiveness Against Explosive Filled Small Arms Threats DEDRA MOORE, AMRDEC — The mortar threats, due to their small size and robust structure, present difficult challenges to new and existing systems for acquisition, tracking, intercept and defeat. Defeat must come through either the fuze or detonation of the explosive. Direct detonation of the explosive payload at the point of intercept via fragment or direct missile impact is considered a more achievable alternative. A pre-detonation of the fuze due to impact can produce similar results. However, fuzes can be a small percentage of the target area. Another possible outcome is the fuze would simply be duded. However, a dudded mortar can be indistinguishable from a non-dudded mortar until it strikes the ground. A robust process must have the capability of analyzing multiple solution types. An extensive database of single fragment impacts against threats with high explosive payloads was utilized to develop and modify models to predict explosive reaction. The goal was to create models or equations that could be incorporated into fast running simulation tools to access potential lethal mechanisms over a wide range of battlespace conditions quickly. A methodology to ascertain impact effectiveness on a typical generic threat fuze was also developed separately to be included in the simulation tools. Computational efforts and trade studies can be conducted with fast running simulation tools whose accuracy had been validated with significant test data.

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