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Forensic Uncertainty Quantification of Explosive Dispersal of Particles[1] KYLE HUGHES, CHANYOUNG PARK, RAPHAEL HAFTKA, NAM-HO KIM, Univ of Florida - Gainesville — In addition to the numerical challenges of simulating the explosive dispersal of particles, validation of the simulation is often plagued with poor knowledge of the experimental conditions. The level of experimental detail required for validation is beyond what is usually included in the literature. This presentation proposes the use of forensic uncertainty quantification (UQ) to investigate validation-quality experiments to discover possible sources of uncertainty that may have been missed in initial design of experiments or under-reported. The current experience of the authors has found that by making an analogy to crime scene investigation when looking at validation experiments, valuable insights may be gained. One examines all the data and documentation provided by the validation experimentalists, corroborates evidence, and quantifies large sources of uncertainty a posteriori with empirical measurements. In addition, it is proposed that forensic UQ may benefit from an independent investigator to help remove possible implicit biases and increases the likelihood of discovering unrecognized uncertainty. Forensic UQ concepts will be discussed and then applied to a set of validation experiments performed at Eglin Air Force Base.

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