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# Operational Planning Simulations of HPM-equipped Swarm Engagements

Clark, Abe; Kaminer, Isaac

Monterey, California: Naval Postgraduate School

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# Operational Planning Simulations of HPM-equipped Swarm Engagements



HPM weapons (represented by cone shapes) engaging multiple attacking drones at ones (photo credit: militaryaerospace.com)

## Problem Statement

- Continue development of mission planning tool for counter-UAS simulations for **modeling dynamics and attrition and optimizing for best tactics / strategies.**
- Package existing software into graphical-user interface (GUI), usable by non-researchers
- Specifically tailor existing simulations to include high power microwave (HPM) weapon characteristics like beam width, range, pulse rate, and intensity.
- End-users: test and develop counter-UAS strategies

## Impact

- Our ongoing program is to develop simulation, and optimization tools to study **adversarial autonomy** scenarios, which do not currently exist
- CRUSER funding will allow transitioning of this modeling framework to a user-friendly package for training, war-gaming, and real-time mission planning
- Success will be measured using feedback from DoD field operators (GBAD) and HPM researchers (NSWCDD; see attached letter)

## Transition

- HPM weapons are a major focus area for researchers at Naval Surface Warfare Center Dahlgren Division (NSWCDD). Currently there is no modeling framework for them to evaluate tradeoffs for design
- Marines at Ground-Based Air Defense (GBAD) work directly with NSWCDD on HPM-equipped drones
- Funding target for FY23 is ONR, “Directed Energy Weapons: High Power Microwaves” program; joint proposal with NSWCDD (see attached letter).