Study of the Small:

Potential for Operational Military Use of Cubesats
Overview

- Growing military interest in CubeSats
- CubeSat Development Partners
- Meeting Military Mission Areas
  - Space Situational Awareness (SSA)
    - Intelligence, Surveillance, Reconnaissance (ISR)
    - Communications (COMM)
  - Offensive & Defensive Counterspace Operations (OCS) (DCS)
- Future CubeSat Capabilities of Value to DoD
Growing Military Interest

- Increase in Military Sponsored CubeSat Initiatives
  - Space Experiments Review Board (SERB) Experiments
  - CubeSat Specific Programs
  - CubeSat Technology Development

NPS-TINYSCOPE (SERB)
CubeSat Development Partners

- DoD: NRO, AFRL, SMC/XR, Navy, Army, Academies (USAFA, NPS, USNA)
- DoE: Los Alamos National Labs, Sandia National Labs
- NASA: ARC, KSC, MSFC
- Other: NSF, Boeing, COSMIAC, SDL, Universities
Meeting Military Mission Areas

- AFDD 2-2: Space Operations
- AFDD 2-2.1: Counterspace Operations
  - SSA
    - ISR
    - SEM
  - DCS
  - OCS
Future Capabilities of Value(1)

- Accurate 3 Axis Pointing
  - Low Swap, High Accuracy
- Reliable/Safe Propulsion
  - Non-volatile, Safe for multiple Cubes in deployer
- Proximity Operations
  - Autonomous Flight Software and Tracking
- High On Orbit Average Power
  - Enough to run high fidelity systems
  - Need away to dissipate excess
- Crosslink Communications
  - Increase of Up/Down with limited ground stations
Future Capabilities of Value (2)

- Multispectral Imaging
  - Could provide more information w/o higher res
- Hardware Encryption
  - For true Mil Ops Hardware Encryption is required
- Software Reconfigurable Radios
  - Ability to change bands/freqs from the ground
- Dedicated Ground Network
  - Portable, Small, for direct warfighter tasking
- Dedicated Small Launch
  - Save Cost and Provide specific orbits for small satellites
Questions

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