Some Thoughts on (Im)Possible Solar System Missions

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From the Literature:

- ERG – A small-satellite mission to investigate the dynamics of the inner magnetosphere

- RHESSI and future small satellites for solar astronomy

- Utilizing small satellites to address mid-latitude ionospheric space weather science questions

- The potential for observing solar system and cosmic X-rays with novel optics on small satellite platforms

- Low-cost Lunar Lander Mission with Mobility for *in-situ* Imaging

- A Small Mission For In Situ Exploration Of a Primitive Binary Near-Earth Asteroid

- Mars Phobos and Deimos Survey (M-PADS)–A Martian Moons Orbiter and Phobos Lander

- Io Volcano Observer (IVO): Budget Travel to the Outer Solar System
Contributions at this Workshop

- The Sun: 4 (3+1)
- The inner Solar System: 1 (0+1)
- The outer Solar System: 0
- Minor bodies/NEOs: 2 (0+2)
- MIST/Space Physics: 11 (4+7)
S-Class Mission Shortlist

- 1. AXIOM-C (X-ray imaging of the magnetosphere – cusps)
- 2. CHEOPS (Exo-planetary transits)
- 3. LARES-2 (Fundamental physics and general relativity testing)
- 4. MASE (Magnetic activity of stars and exoplanets)
- 5. NITRO (Composition measurement in the inner magnetosphere and auroral region)
- 6. PlaVi (Exo-planetary transits and asteroseismology)
- 7. SIRIUS (Ultraviolet spectroscopy of stars and interstellar medium)
- 8. TOR (Energy dissipation in solar wind turbulence)
- 9. SIGMA (Measurements of the solar corona magnetic field)
- 10. XIPE (X-ray imaging polarimetry)
2. The research progress

2.2 “Three satellite formation for space environment exploration” key project

- “Eleventh Five-Year” period, the Beihang University jointing with DFH Satellite Ltd., Chinese Academy of Sciences Space Center and Tsinghua University, the “Three satellite formation exploration space environment” key project
2. Overall mission analysis and technology requirement

2.1 Project mission——2) Space environment exploration

☐ **Three innovation tasks**

1. Research of accuracy detection/exploration for the shadow side of near-earth space environment current system

2. Research of near-earth plasma environment in small scale structure and motion layer

3. The increase and decrease of high energy particle in radiation belt both in time and in space evolution process

☐ **Three extended tasks**

4. Evolution process and forms of aurora when auroral storm and auroral electrojet occurs

5. Coupling effect between magnetosphere and ionosphere

6. Ionosphere disturbance induced by activity of magnetosphere
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