

Abstract

Astronomical instruments and methods have become increasingly used in military space research. It is also quite possible to use these same techniques for verifying arms control agreements related to space-based weapons and ground-based deployment of troops and weapons.

Early satellite tracking programs are described, including: "MOONWATCH" which involved the use of civilians making visual observations, the Baker-Nunn camera system, photometric observation systems and the Ground-Based Electro-Optical Deep Space Surveillance (GEODSS) system. There follows a short section outlining the resolution potential of various optical and radar systems.

The author then discusses developments in the area of space-based weapons, including Fractional Orbital Bombardment Systems (FOBS) as well as Directed Energy and other Anti-Satellite (ASAT) weapons. International agreements relating to the militarization of space are reviewed and the role of ground-based and space-based systems for monitoring these and other treaties is reviewed.

Among the author's observations are:

1. Satellite tracking is likely to become more important as the military use of space increases.
2. Proposals for arms control verification in space should include the use of technology at the same level as the systems to be verified.
3. As Baker-Nunn cameras used by the military are replaced by electro-optical systems, their transfer to astronomical institutions would be useful in the development of verification techniques in the academic sector.
4. Spin-offs from military astronomical technology development should be realized by scientific institutions for asteroid tracking, binary-star resolution, quasar studies and other projects.
5. Canada stands in a good position to contribute to ground-based verification studies on an international scale and possesses the necessary technical means, manpower and facilities to remain in such a position for the long term.
6. If additional GEODSS stations were to be established, it would be useful to consider Canada as a possible site.
7. Canadian astronomy, one of Canada's most prized scientific strengths, has been undermined by lack of modern equipment. If Canada participates in advanced technology projects, one spin-off advantage of such participation could be the application of astronomical technology to the verification of arms control agreements.

Résumé

L'emploi des instruments et des méthodes astronomiques se répand dans la recherche spatiale à des fins militaires. En outre, il y a de nombreuses possibilités d'application de ces mêmes techniques à la vérification des accords de contrôle des armements ayant trait aux armes basées dans l'espace ainsi qu'au déploiement terrestre de troupes et d'armes.

L'auteur décrit les premiers programmes de poursuite des satellites, dont le réseau «Moonwatch», qui prévoyait des observations visuelles par des civils, le système de caméra Baker-Nunn, les réseaux d'observation photométriques et le système de Surveillance terrestre électro-optique de l'espace lointain (GEODSS = Ground Based Electro-Optical Deep Space Surveillance). Suit alors une brève section sur la capacité de résolution de divers systèmes optiques et radars.

L'auteur examine ensuite l'évolution des armes basées dans l'espace, notamment les systèmes de bombardement à orbite fractionnaire (FOBS = Fractional Orbital Bombardment Systems) ainsi que les armes à énergie dirigée et autres armes anti-satellites (ASAT), puis il passe en revue les accords internationaux concernant la militarisation de l'espace et examine le rôle que jouent les systèmes terrestres et spatiaux dans la surveillance de ces accords et autres traités.