

AKA 6: Surveillance and Space Security

Time: Thursday 16:30–18:00

Location: H 0110

AKA 6.1 Thu 16:30 H 0110

Rethinking space based early warning concepts against the missile threat — ●GERD HOFSCHESTER — OHB-System AG, Universitätsallee 27-29, 28359 Bremen

Space flight engineering has played an ambivalent role in the cold war. On one hand rocketry, together with nuclear engineering, was a major threat. On the other hand the possibilities of reconnaissance were the basis for disarmament treaties. In spite of that experience, the application of space technologies for security is mostly considered from the point of view of military operations. A typical example for such a behaviour is the actual discussion about missile defence. The basic idea is to develop the capability of self defence in case of an attack. Such an approach normally leaves out the possibilities of avoidance of such a situation. The threat has changed after the cold war and therefore the continuation of old technical concepts is not an adequate solution. So it is necessary to rethink our concepts and find solutions, which are not only cross-linked to military applications, but also to policy, diplomacy and verification. Finally the concepts have to be suitable to actual budgetary restrictions. OHB-System led a study team of small and mid-sized German companies for the creation of new space based early warning concepts. The result is a proposal for a constellation of small satellites, which would be also capable to detect armament activities in the field of ballistic missiles of certain countries of concern, month and years before a real military threat. This would give diplomacy and politics the time to find solutions. The realization of the concept would cost less than 500 Mio. Euros, which is in the order of magnitude less than conventional approaches. Perhaps the most important advantage of the system is, that it cannot be interpreted as threat to any great power and therefore no arms race would occur as a consequence.

AKA 6.2 Thu 17:00 H 0110

Die Auswirkung des chinesischen Anti-Satellitentests auf die Weltraummüllumgebung — ●CARSTEN WIEDEMANN¹, PATRICIA NETZLAF¹, SEBASTIAN STABROTH¹, HOLGER KRAG² und PETER VÖRSMANN¹ — ¹TU Braunschweig, Institut für Luft- und Raumfahrtssysteme, Hermann-Blenk-Str. 23, 38108 Braunschweig — ²Space Debris Office, ESA/ESOC, Robert-Bosch-Str. 5, 64293 Darmstadt

China hat am 11. Januar 2007 eine Anti-Satelliten-Waffe (ASAT) im

Weltraum getestet. Das Ziel des ASAT-Tests war die Zerstörung eines im Jahr 1999 gestarteten chinesischen Wettersatelliten mit der Bezeichnung Feng Yun 1C, der sich in ca. 850 Kilometern Höhe auf einer sonnensynchronen Umlaufbahn befand. Dieser Test war eines von etwa 200 Fragmentationsergebnissen, die sich seit dem Beginn der Raumfahrt auf Erdumlaufbahnen ereignet haben. Die Anzahl der von Radaranlagen entdeckten größeren Trümmer des chinesischen ASAT-Tests ist sehr hoch. In dem nicht beobachtbaren Kleinteilbereich ist die Trümmerzahl vermutlich ebenfalls deutlich angestiegen. Diese Vermutung wird überprüft, indem die Trümmerentstehung und ihre zeitliche sowie räumliche Verteilung modelliert werden. Aus der Objektpopulation wird der Partikelfluss für Satelliten abgeleitet. Im Vordergrund steht die Untersuchung der Partikelflusses auf Satellitenoberflächen, die sich nahe der Bahnhöhe befinden, in welcher der Test durchgeführt wurde. Die Ergebnisse zeigen, dass das Kollisionsrisiko in 850 km Höhe angestiegen ist.

AKA 6.3 Thu 17:30 H 0110

The Airborne Laser - Assessment of a High Energy Laser project — ●JAN STUPL¹, GÖTZ NEUNECK¹, CLAUS EMMELMANN², HARTWIG SPITZER³, and MARTIN B. KALINOWSKI⁴ — ¹Institut für Friedensforschung und Sicherheitspolitik an der Universität Hamburg (IFSH) — ²Institut für Laser- und Anlagentechnik, TU Hamburg-Harburg (iLAS) — ³Institut für Experimentalphysik, Universität Hamburg — ⁴Zentrum für Naturwissenschaft und Friedensforschung (ZNF)

The Airborne Laser (ABL) is a project undertaken by the U. S. missile defense agency. The basic idea is to install a megawatt class chemical laser into a freighter jet in order to destroy missiles in their boost phase over distances of several hundred kilometres.

This talk presents an independent analysis of the ABL's technical capabilities. Calculations of missile and satellite trajectories are combined with atmospheric physics and structural mechanics calculations in order to assess the ABL's implications.

One result is that the laser will not be able to destroy missile warheads for significant distances, but only missile boosters. Warheads will fall short of intended targets and may endanger third parties. Exemplary calculations to narrow down possible impact points are presented.