

**AKA 3: Neue Technologien, Dual-Use und präventive Rüstungskontrolle**

Time: Thursday 12:00–13:00

Location: H45

AKA 3.1 Thu 12:00 H45

**Assessment of a High Energy Laser missile defense project** — ●JAN STUPL<sup>1,2,3</sup>, GÖTZ NEUNECK<sup>1</sup>, CLAUS EMMELMANN<sup>2</sup>, and HARTWIG SPITZER<sup>3</sup> — <sup>1</sup>Institut für Friedensforschung und Sicherheitspolitik an der Universität Hamburg (IFSH) — <sup>2</sup>Institut für Laser- und Anlagentechnik (iLAS), Technische Universität Hamburg-Harburg — <sup>3</sup>Institut für Experimentalphysik, Universität Hamburg

Today, a number of military research programs focus on high energy laser based Directed energy weapons. One possible application for HEL weapons is missile defense. The most prominent U.S. weapon project concerned with this task is the U.S. Airborne Laser (ABL).

The basic idea behind the ABL is to install a megawatt class chemical laser into a freighter jet and destroy missiles in their boost phase over distances of several hundred kilometres. This talk presents analyses in progress regarding the ABL's technical implications for missile defense and other applications. Results in regard to possible structural damage of target objects at temperatures below their melting point will be presented. As the ABL will not be able to destroy missile warheads but only missile boosters, the necessary laser dwell time until material failure takes place determines, where potentially dangerous warheads will come down. This might endanger third parties and has political implications.

AKA 3.2 Thu 12:30 H45

**Millimeter-Wave Beam Weapon: No Lingering Damage?** — ●JÜRGEN ALTMANN — Experimentelle Physik III, Universität Dortmund, 44221 Dortmund

Since 1994 the so-called Active Denial System has been developed in the USA (secret until 2001), which is to produce heat pain with 95-GHz radiation (penetration depth in skin about 0.4 mm) from a 3-m size antenna over many 100 m, allegedly without lingering damage. Important specifications (beam power, widening) are secret, but can be derived roughly from publications (intensity around  $10^4$  W/m<sup>2</sup>). According to models and measurements of the US Air Force Research Laboratory the pain threshold (at heating by 10 K) is reached after few seconds. My own modelling shows that the threshold for second- and third-degree burns is transcended after about the triple time. Experiment designs had to be released under the Freedom of Information Act. Here the voluntary subjects could escape behind a screen, different from a real operation. Nothing has been announced concerning mechanisms to limit heating. Deployment e.g. in Iraq encounters political reservations in the US Department of Defense. For an assessment technical, operational, legal and ethical aspects will be discussed.