ABOUT THE INSTITUTE

The Fraunhofer Institute for Technological Trend Analysis INT provides scientifically sound assessments and counseling on the entire spectrum of technological developments. On this basis, the Institute conducts Technology Forecasting, making possible a long-term approach to strategic research planning. Fraunhofer INT constantly applies this competence in these competences into projects tailor-made for our clients.

Over and above these skills, we run our own experimental and theoretical research on the effects of ionizing and electromagnetic radiation on electronic components, as well as on radiation detection systems. To this end, INT is equipped with the latest measurement technology. Our main laboratory and large-scale appliances are radiation sources, electromagnetic simulation facilities and detector systems that cannot be found in this combination in any other civilian body in Germany.

For more than 40 years, INT has been a reliable partner for the Federal German Ministry of Defense, which it advises in close cooperation and for which it carries out research in technology analysis and strategic planning as well as radiation effects. INT also successfully advises and conducts research for domestic and international civilian clients: both public bodies and industry, from SMEs to DAX 30 companies.

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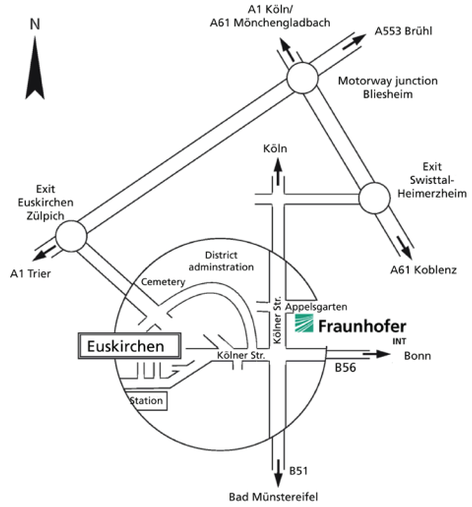

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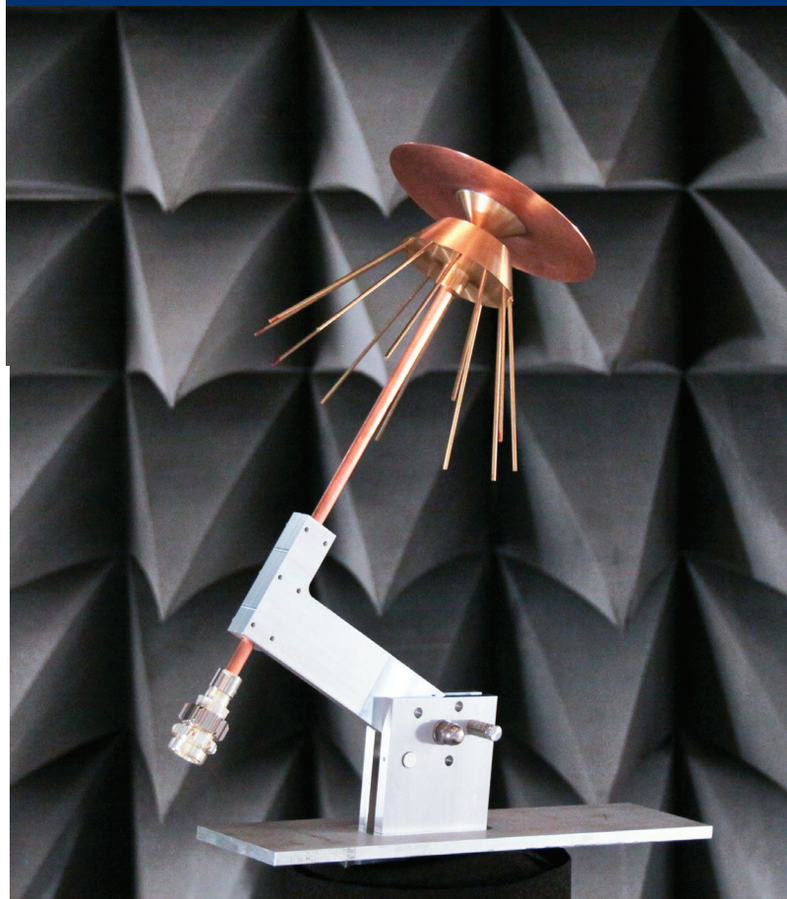
FRAUNHOFER INSTITUTE FOR TECHNOLOGICAL TREND ANALYSIS

BUSINESS UNIT

ELECTROMAGNETIC EFFECTS AND THREATS



BUSINESS UNIT
ELECTROMAGNETIC EFFECTS
AND THREATS

The business unit of electromagnetic effects and threats conducts applied research on coupling electromagnetic fields in devices and systems, interferences in electronic circuits caused by fields and interfering signals, and the analysis of electromagnetic threats. Part of the extensive field of Electromagnetic Compatibility (EMC), this research particularly contributes to the national assessment ability on electromagnetic weapons effects and their respective precautions.

The business unit develops a. o. measurement techniques for electromagnetic fields and electromagnetic properties of novel materials in the microwave range. The measurement equipment developed can also be applied in other EMC measurements. Our experimental research is complemented by numerical simulations.

The INT operates high performance field simulation facilities that cover measurement frequencies up to the higher gigahertz range. These facilities, along with the expertise of the business unit, are available to both military and civilian clients. The INT participates in international cooperations which include defense institutions, university institutes, military industrial companies and research institutions.

NUCLEAR ELECTROMAGNETIC PULSE

In the past, the Institute dealt intensively with the effects of the nuclear electromagnetic pulse (NEMP). In light of the constantly changing security situation, there has been an increasing demand for scientific services related to NEMP in recent times. Relying on our decade-long and historically grown experience, the business unit offers you, among others, the following services:

- Research on the NEMP behavior and planning support for the NEMP curing of future systems
- Operating a field simulation facility for coupling measurements on scaled-down models
- Examination of typical component and device families as to interference and damage threshold values upon direct injection and field coupling
- Adaptation of theoretical and experimental work to future threats caused by modern nuclear weapons.

HIGH-POWER MICROWAVES

Since the early nineties, the INT has focused its research on threats caused by novel electromagnetic effects, particularly by high-power microwaves (HPM):

- Development of measurement techniques for microwave coupling measurements (probes, antennas, analyzer systems, mode-stirred chambers)
- Fixed and mobile irradiation facilities for medium and high power pulsed microwaves
- EMC measurement technology for modern materials (CFRP, GRP)
- EMC measurement technology and methods in view of the »generalized EMC« incl. HPM protection and for the higher gigahertz range
- Theoretical-physical research on HPM generation and propagation as well as on criminal and terrorist HPM threat scenarios
- Analyzing new technological developments in the area of electromagnetic effects (terahertz radiation, metamaterials)