

ISMAEL – Sensors multiplying airport safety

Modern airports are equipped with a range of technologies to monitor vehicles on the ground, be it aircraft or service vehicles, because a precise picture of the traffic on the runways and other airport routes is a precondition for passenger and airport safety. Standard technologies used for airport monitoring today are ground radar and surveillance video and infrared cameras.

All three technologies have their inherent limitations: The number of radar antennas on a given surface is limited, as their electromagnetic radiation can pose a health risk or cause problems of interference. Like ground radar, cameras cannot 'look' around corners or beyond objects. In addition, cameras do not work unfailingly in heavy rain or snowfall, in fog or hard frost.

The prime objective of ISMAEL was to develop and test an additional airport safety technology not subject to the limitations of radar and cameras, and based on a different natural phenomenon, namely magnetism: The earth is surrounded by an invisible magnetic field. Each and every ferro-metallic object slightly alters this magnetic field. Would it be possible to measure the alterations of the magnetic field caused by aircraft and service vehicles in an airport?

The ISMAEL team dug magnetic sensors in the ground at the runway entrances and taxiways of three European airports: Frankfurt Rhein-Main, Europe's second-largest airport, the mid-sized Thessalonica airport in Greece, and the small aerodrome in Saarbrücken, Germany. The sensors put into the ground were extremely cheap, as the project used standard magnetic heads available on the market and normally used for hard disk readers.

The project's results exceeded the expectations. Not only was it possible to exactly pinpoint the location of vehicles in the airport in almost all weather conditions, but also to specify the kind of vehicle that was sensed. The accuracy of the measurements was so high, that not only aircraft could be distinguished from service vehicles, but also types of aircraft from each other.

The EU-funded ISMAEL project ended in July 2007. However, activities towards marketing of the system are ongoing. At the moment, the standardization and certification procedures are underway, and negotiations with interested entrepreneurs are held. Due to the flexibility of the system – it can be used for airports of all sizes – and its cheapness, interest in the technology is high. In early spring 2009, talks were e.g. held with a Middle-east company having a strong interest in the system.

