

# ISMAEL – Intelligent Airport Surveillance Based on Low Cost Magnetic Field Detectors

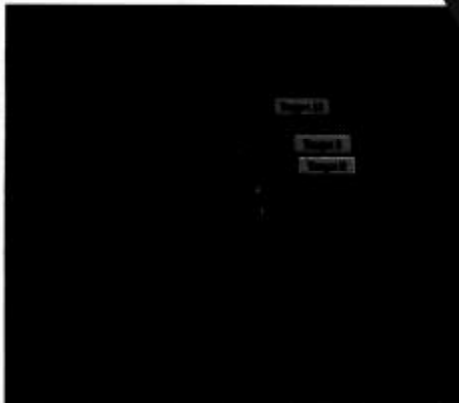


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## Introduction

Ground control at airports has become an increasingly difficult task due to increasing traffic levels, growing airport complexity and the need to continue operation even under low visibility conditions. Recent research has shown that traffic volumes at European airports will continue to increase, at least doubling every 12 years. Furthermore, statistics from Eurocontrol and the FAA reveal that the highest risk portion of a flight is in fact ground movement. Specifically, runway incursion is considered as one of the most critical safety issues for all airports. This problem is being addressed by the introduction of A-SMGCS (Advanced Surface Movement Guidance and Control Systems), the main goal of which is to provide maintenance



of uninterrupted traffic capacity under any weather conditions. A-SMGCS systems are mainly based on surface movement radars (SMR) and Multilateration systems. Multilateration systems fitted to existing taxiway light housings, providing easy and cheap installation and maintenance. ISMAEL detectors have been tested successfully at Thessaloniki airport, Greece and Frankfurt airport, Germany.

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## Application

ISMAEL can support air traffic controllers in carrying out airport surveillance. ISMAEL may serve as "gap filler" in large airports for areas where existing surveillance techniques are not effective, or as a low-cost alternative to radar or multi-lateration at smaller airports. The solution is also very appropriate for the prevention of runway incursions. Using appropriately located magnetic detectors, each runway access point can be monitored for intruding vehicles. Finally, ISMAEL also offers an easy way to provide reliable gate occupancy information.

Test trials at both test sites show that magnetic sensing can be used to detect and locate aircraft and vehicles, both moving and stationary. The major benefits are that it offers a complementary detection technology to augment an existing A-SMGCS, or a low-cost alternative for smaller regional airports. In general the solution is characterized by low energy consumption and a modular architecture that allows for easy system upgrades and extensions to suit different airports.



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