



The 14th European Radar Conference

**Duration: 08:30 - 17:50**

**Room: Riga**

**WF-01**

### **Present and Future Perspectives of Passive Radar**

**Organisers:**

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**Abstract**

Passive Radar (also known as Passive Coherent Location, PCL) uses ambient radio signals (transmitter of opportunity) to illuminate the target environment. This makes it resilient against detection and ubiquitous in application. As PCL is per se bi-/multi-static, its performance heavily depends on the availability of multiple illuminators and/or observers and requires multiple sensor data fusion. While conventional radio transmitters (FM, TV and DAB/DVB) have been used so far, the availability of new radio services offers unprecedented opportunities for PCL. These include new satellite services and wireless systems. Whereas usage of GSM for PCL was already proposed, the new 4G mobile radio system concepts like LTE, and even more the envisaged 5G standard (still in preparation) will offer entirely new features that have not yet been fully explored. Interesting new features will be attributed, e.g. to new waveforms, scalable radio interfaces, flexible radio resource allocation, multiple antenna technologies, new frequencies, etc. On the other hand, cheap yet powerful software defined radio platforms are available. Moreover, ultra-light personal air platforms are becoming popular, as well as inexpensive unmanned flying platforms. These targets are not easily detected by conventional radar. Similarly the planned introduction of autonomous driving would require a large amount of radar sensing for road traffic control and safety.

Passive radar seems to be an approach to establish ubiquitous radar services based on pervasive illumination. Thus, PCL can be considered a green technology that does not need (resp. waste) scarce frequency resources. Radio services from satellite via cellular down to WiFi can be exploited for a variety of applications on different scales from remote sensing down to road traffic management and private security.

The aim of the workshop is to start from the state-of-the-art and move towards the future perspectives of PCL in the light of new and upcoming radio services, ubiquitous mobile platforms, and emerging application needs.

**Programme**

**08:30 - 09:00 Passive Radar on Fixed and Mobile Platforms Exploiting Digital Broadcast Signals**

Heiner Kuschel, FHG/FHR, Germany

**09:00 - 09:30 FM/DAB/DVB-T Multiband Multistatic Passive Radar System – Design Considerations and Lessons Learnt**

Michael Edrich, HENSOLDT Sensors GmbH, Germany

**09:30 - 10:00 Data Association in Multistatic Passive Radar Systems**

Martina Brötje, Wolfgang Koch, FHG/FKIE, Germany

**10:10 - 10:50 Break**

**10:50 - 11:20 WiFi-Based Passive Radar for Short Range Surveillance: Detecting and Locating Air Targets, Surface Vehicles and Human Beings**

Fabiola Colone, Pierfrancesco Lombardo, University of Rome La Sapienza, Italy

**11:20 - 11:50 GSM Passive Coherent Location: Signal Processing and Applications**

Reda Zemmari, Wolfgang Koch, FHG/FKIE, Germany

**11:50 - 12:20 Perspectives of Cooperative PCL in Next Generation Mobile Radio**

Reiner Thomä, TU Ilmenau, Germany

**12:30 - 13:50 Break**

**13:50 - 14:20 Passive Forward Scatter Radar**

Marina Gashinova, Mike Cherniakov, University of Birmingham, UK

**14:20 - 14:50 Passive Radars on Mobile Platforms - New Changes and New Benefits**

Krzysztof Kulpa, Warsaw University of Technology, Poland



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***14:50 - 15:20 Passive Imaging Using SAR and ISAR Technology***

Piotr Samczynski, Mateusz Malanowski, Warsaw University of Technology, Poland

***15:30 - 16:10 Break***

***16:10 - 16:40 GNSS-Based Passive Radar***

Mike Antoniou, University of Birmingham, UK

Debora Pastina, University of Rome La Sapienza, Italy

***16:40 - 17:10 Passive Radar at ZESS – From HITCHHIKER to ASTRA***

Otmar Loffeld, University of Siegen, Germany