**Usage of Cellular Device for mapping of moving and obscured targets**

**Abstract**

We propose to perform a spatial location finding of objects based upon using portable cellular devices. The data is derived from a set of time delayed signals observed by array of receiving elements having arbitrary and a priori known distribution in space. The popular solution of direction finding is based on time of arrival (TOA) measurement. The accuracy of the measurement depends strongly on different system and scenario parameters such as: target relative distance, number of elements, distances between the elements, azimuth and elevation beam widths which may cause ambiguity and multi path effects. For operational systems, it is important to have the ability to identify not only static targets but also moving ones. One of the modern solutions is time difference of arrival (TDOA) measurement. In addition to improve accuracy, we employ an advanced process, delta delta phase (DDPHASE) technique which is suitable for slow moving target such as in our scenario. We show that such a solution is feasible with reasonable accuracy for the detection of targets even behind a concrete wall. We present some of the system tradeoffs for optimal operation with regard to applicable operational requirements.

Bar-Ilan University, Ramat-Gan, Israel Faculty of Engineering

Corresponding and Presenting Author: Dr. Isahar Gabay

E-mail: gabay55@zahav.net.il

Co-author #2: Prof. Meir Danino

E-mail: [meir.danino@biu.ac.il](mailto:meir.danino@biu.ac.il)

Co-author #3: Prof. Zeev Zalevsky

E-mail: zeev.zalevsky@biu.ac.il