

## AOC Aardvark Roost Chapter

### Mini conference Program: 4 May 2011

12:30 – 13:00	Registration and Coffee	
13:00 – 13:10	Welcome address	Dave Howe Saab EDS
13:10 – 13:40	New signals in the traditionally radar band of 2-18 GHz	Wimpie van den Berg Grintek Ewation
13:40 – 14:10	Saab experience regarding new signals in the traditionally radar band of 2-18, and what can be done about the problem	Christina Cilliers & Arno Böhmer, Saab EDS
14:10 – 14:30	Break	
14:30 – 15:00	Development of Mid-Infrared Solid-State Lasers	Daniel Esser, CSIR National Laser Centre
15:00 – 15:30	The benefit of using numerical electromagnetic simulation for the design of EW systems	Bennie Jacobs, Saab EDS
15:30 – 16:00	Closing remarks – Chairman of the Aardvark Roost	Mr Gerrie Radloff
16:00 -	Cocktail function	

**Title: Presentation 1**

The benefit of using numerical electromagnetic simulation for the design of EW systems.

**Abstract:**

Antennas can be regarded as the eyes, ears and mouth of an EW (Electronic Warfare) system. Antennas are either built in-house or bought as components, with the manufacturer typically providing the performance of the antenna measured under "ideal" free space conditions. When these antennas are placed on a platform the installed performance can degrade dramatically compared to the ideal free space case. It is specifically concerning this problem that numerical electromagnetic simulation can be very beneficial in the design of EW systems. The increase in computational power and improvement of numerical methods have made it possible to use numerical methods such as Method of Moments (MoM) and Finite Difference Time Domain (FDTD) techniques to analyze and design ever increasingly complex electromagnetic problems. Using numerical methods it is possible to develop simulation models of the complete platform with the antenna that can accurately predict the installed performance. The knowledge from these simulations can be used to find an optimal position on the platform to ensure the required coverage is met. The calculated patterns can also be used to generate calibration tables for DF (Direction Finding). Electromagnetic simulation can therefore be very beneficial to the design of EW systems by reducing development time, risk and the associated costs.

**Presenter**

Bennie Jacobs received the B Eng, B Eng (Hons) and M Eng Electronic Engineering degrees, all cum laude in 2006, 2007 and 2011 respectively from the University of Pretoria. He was employed on a contract basis in December 2006 at the then Saab Grintek Technologies in the Antennas department as a research and development engineer. Since 2009 he is employed on a permanent basis at Saab EDS, EW operations. He specializes in the development of electromagnetic models for the simulation of antennas, as well as the prediction of DF accuracy using measured and or simulated antenna performance.

**Title: Development of Mid-Infrared Solid-State Lasers****Abstract:**

Research is conducted at the CSIR National Laser Centre towards the development of high-power and high-energy solid-state lasers operating at 2  $\mu\text{m}$  and 3-5  $\mu\text{m}$  wavelength which are suitable for a number of applications, including Directed Infrared Countermeasures. The scheme employed to scale these lasers to high energies is based on high-power diode lasers at 0.8  $\mu\text{m}$  efficiently pumping a  $\text{Tm}^{3+}$  doped laser emitting at 1.9  $\mu\text{m}$ , which pumps a  $\text{Ho}^{3+}$  doped laser producing laser pulses at 2  $\mu\text{m}$  which can subsequently be converted further into the mid-infrared spectral region. The Laser Systems Group at the National Laser Centre has demonstrated a number of record-breaking lasers based on this concept. These lasers will be discussed as well as their implementation in defence applications. The future development of 8-12  $\mu\text{m}$  laser output using all-solid-state technology will also be presented.

**Presenter:**

Daniel Esser was born in Johannesburg, South Africa, on February 22, 1978. He obtained his Doctorate of Engineering in Photonics from Heriot-Watt University in Edinburgh end of 2010 while working full-time at the CSIR National Laser Centre since 2004. At the Centre he is employed as a Principal Scientist and is Group Leader of the Laser Systems Group specializing in diode-pumped solid-state lasers and devices in the mid-infrared spectral range.

**Title: Presentation 3**

**Abstract:**

**Presenter:**

**Title: Presentation 4**

**Abstract:**

**Presenter:**