Seminar PulsarPlane

Wednesday, May 14ᵗʰ 2014, 10h00, EA3 (Alameda)

A Feasibility Study For Millisecond Radio Pulsar Navigation

Abstract: Stars have been used -in what is called celestial navigation- since thousands of years by mankind. Recently the interest in celestial navigation has sparked again with an emphasis on navigation using pulsars (fast rotating neutron stars) for applications in deep space.

Pulsars emit electromagnetic radiation, which is received anywhere in our solar system (so also on Earth) as a series of very stable fast periodic pulses with periods in between milliseconds and up to 10 seconds. Pulsars can provide stable frequency standards and the variance of the millisecond pulsars -the most stable astronomical clocks- is comparable to that of atomic clocks. The pulsar emits radiowaves and particles along its magnetic axis. From a far distance the reception of the electromagnetic waves can be compared with that of a light house.

The presentation will show some preliminary results obtained from a research project PulsarPlane under the European 7th Framework Programme as a pioneering idea, i.e. technologies and concepts that have the potential to bring step changes in the second half of this century and beyond. The objective of the project is to investigate the feasibility of a navigation system inside the Earth's atmosphere using signals from millisecond radio pulsars.

Peter Buist is a Senior R&D Engineer at the National Aerospace Laboratory NLR of the Netherlands and the coordinator for PulsarPlane, a research project under the FP7-Aeronautics and Air Transport (AAT) Work Programme 2013.

He worked in the Japanese aerospace industry for years, specializing in particular in Global Navigation Satellite System. In Japan, he developed GPS receivers for the –among others- Japanese SERVIS-1, USERS, ALOS satellites and the H2A rocket. His current research interest includes all aspects of navigation and onboard data processing. He holds an MSc and a PhD degree from Delft University of Technology, the Netherlands.

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