11:45 Ionospheric information obtained from ELF whistlers detected by the ESA Swarm satellites *Coïsson, P et al.* Oral

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Lightning strikes generate broadband electromagnetic signals that propagate into the atmosphere and can reach into the ionosphere. Dispersion of the waves within the ionosphere generates a frequency dependent propagation time, producing whistler signals. At ELF frequencies the signal dispersion and the cutoff frequency depend on ions composition and their gyrofrequencies. The frequencies below 125 Hz thus provide additional information on the ionospheric status not accessible from other frequency bands. During the commissioning phase of the Swarm mission several burst-mode sessions of the Absolute Scalar Magnetometers (ASM) were operated between December 2013 and February 2014, during which the sampling frequency was raised from the nominal 1 Hz to 250 Hz. A large number of whistlers in the ELF frequency band were obtained during these sessions, associated with the lightning activity in the troposphere. By correlating the whistlers with ground-detected lightnings from the World Wide Lightning Location Network, we were able to study the lightning detection efficiency at Swarm altitude. By taking advantage of the simultaneous electron density measurements made by Swarm, we were also able to study the dependence of the whistler dispersion with the ionospheric and geomagnetic conditions encountered by the satellites. This appears to provide new way to derive information on the electron and ion density profiles over areas where no other measurements are available. As we shall illustrate, this information could in turn be used to better constrain ionospheric models such as IRI and NeQuick. New regular ASM burst-mode sessions are now planned for the rest of the Swarm mission that will provide additional data valuable for the investigation of the ionosphere below the satellites.