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Swarm thermospheric density data during the 2016-2018 deep solar minimum

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The Swarm mission flies a constellation of three identical satellites, which carry not only technologically advanced magnetometers but also other important and fundamental instruments, such as GPS receivers and accelerometers. The GPS data are mainly used for precise orbit determination (POD). In addition, a POD approach developed at TU Delft, converts Swarm GPS information into accelerations: the gravitational accelerations are modelled with high fidelity, whereas the non-gravitational accelerations are estimated with a Kalman filter strategy. The resulting GPS-derived accelerations for all three Swarm satellites are converted directly into thermosphere neutral density data. The GPS-derived products also supplement the accelerometer-derived data of Swarm C. Furthermore, a combination of the non-gravitational acceleration derived from the GPS receiver and the measurements of the accelerometer for Swarm C resulted in the recently released accelerometer products. The latest improvements of the processing associated to the new high-fidelity geometry and the comparison between the GPS-only and accelerometer-derived data are presented in this work. Moreover, the most recent thermospheric neutral density data show signs of a very deep solar minimum, similar to the one in 2008. These data, together with their comparisons with several thermosphere models, are also included in the presentation.