



## **CM5: A pre-Swarm magnetic field model based upon the comprehensive modeling approach**

**Sabaka, T.; Olsen, Nils; Tyler, Robert**

*Published in:*  
Geophysical Research Abstracts

*Publication date:*  
2014

*Document Version*  
Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

*Citation (APA):*  
Sabaka, T., Olsen, N., & Tyler, R. (2014). CM5: A pre-Swarm magnetic field model based upon the comprehensive modeling approach. *Geophysical Research Abstracts*, 16, [EGU2014-6883].

---

### **General rights**

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.



## **CM5: A pre-*Swarm* magnetic field model based upon the comprehensive modeling approach**

Terence Sabaka (1), Nils Olsen (2), and Robert Tyler (3)

(1) Geodynamics Branch, NASA GSFC, Greenbelt/MD, USA ([terence.j.sabaka@nasa.gov](mailto:terence.j.sabaka@nasa.gov)), (2) DTU Space, Technical University of Denmark, (3) Dept. Astronomy, University of Maryland at College Park, USA

We have developed a model based upon the very successful Comprehensive Modeling (CM) approach using recent CHAMP, Ørsted, SAC-C and observatory hourly-means data from September 2000 to the end of 2013. This CM, called CM5, was derived from the algorithm that will provide a consistent line of Level-2 data products for the *Swarm* mission. This algorithm uses a special statistical treatment that allows certain parameter subsets to be determined from the best suited data subsets. Indeed, this allows for a co-estimation of parameters describing the magnetic field of the ionospheric Sq current system and the lithospheric with no contaminating leakage into the latter. The lithospheric field compares well with MF7 and CHAOS-4 at least to spherical harmonic degree 90. In addition, we have estimated the magnetic field generated by the oceanic M2 tidal constituent, which compares well with simulations using the known M2 tidal flow. This model will be useful for magnetic induction studies as well as providing a reference model for *Swarm*-based models coming soon.