

***Interactive comment on* “Lower Thermosphere response to solar activity: an EMD analysis of GOCE 2009–2012 data” by Alberto Bigazzi et al.**

Anonymous Referee #1

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Review of “Lower Thermosphere Response to Solar Activity: An EMD Analysis of GOCE 2009-2012 Data” by Bigazzi, Cauli and Berrilli The authors are to be commended for writing a clear, incisive work on ionospheric density variations over part of a solar cycle using the low altitude GOCE satellite. This is the best work on ionospheric density variations that I have ever seen. This should become a standard reference in the field. I have no comments to add. Please publish as is. With this article clearly establishing the ionospheric density dependences on solar EUV and Ap, I am wondering whether the authors could try to extend their work to higher time resolution events, such as during magnetic storms? There are two main mechanisms that have been proposed for ionospheric density variations during high geomagnetic activity, that of the disturbance dynamo (Blanc and Richmond JGR 1980) and the dayside superfountain

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effect (Tsurutani et al. JGR 2004; Mannucci et al. GRL 2005). These mechanisms suggest different locations of TEC effects and it would be great if you could determine experimentally what the overall effects are during storms from the GOCE data.

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