

## **General comments:**

This paper aims to summarize our present understanding of the magnetospheric response to solar wind forcing from the ULF wave – particle interaction perspective. Topics addressed include solar wind pressure pulses, poloidal mode waves and their interaction with electrons in the radiation belt, ring current ions and plasmaspheric electrons, focusing on radial transport due to ULF waves. Theoretical, modelling and measurement studies are reviewed.

Summarizing the above topic in a review paper is understandably a formidable task, and it is certainly understood that a lot of important papers will naturally be missed, but several other review papers could be referenced. Such examples are:

– Friedel et al. (2002), Relativistic electron dynamics in the inner magnetosphere – a review, *J. Atmos. Solar Terr. Phys.*, 64(2), 265, doi:10.1016/S1364-6826(01)00088-8

– Shprits et al. (2008), Review of modeling of losses and sources of relativistic electrons in the outer radiation belt I: Radial transport, *J. Atmos. Solar Terr. Phys.*, 70(14), 1679, doi:10.1016/j.jastp.2008.06.008.

– Elkington et al. (2016), The Role of Pc-5 ULF Waves in the Radiation Belts: Current Understanding and Open Questions, in: *Waves, Particles, and Storms in Geospace*, Oxford University Press, doi:10.1093/acprof:oso/9780198705246.003.0005

A general comment concerns the introductory section: on line 195 the overall organization of the paper is given, including section 1 of the introduction; this could be earlier on, as it reads a bit out of place.

## **Minor comments and corrections:**

line 73: "...and are also known as..."

line 109: "Earth's magnetospheric activities" → perhaps activity in singular form is more appropriate

line 111: "...can take various forms, and most often would excite..."

line 104: "through the ULF wave" → "through ULF wave"

line 110: the following sentence is repeated in line 112: "The energy coupling between the solar wind and the Earth's magnetosphere can take various forms, most often would excite different plasma waves inside magnetosphere, one of which is the ULF wave."

line 124: "the sudden raise or drop dynamic pressure" → "the sudden raise or drop of dynamic pressure"

229: "Assumed that a running pulse..." → "Let us assume that a running pulse..."

237: "is about1 min" → "is about 1 min"

352: "Once the drift resonance is satisfied" → "Once the drift resonance condition is satisfied"

403: Whereas, In the ULF wave → Whereas, in the ULF wave

416: globally

473: as well as modulations

480: Thus, it is crucial

563: how poloidal ULF waves interact with cold plasmaspheric population

731: "TheULF waves" → "The ULF waves"