The paper by Sabri & Poedts models 2 CMEs that impact the Earth. The output of the model provides the expected Kp index. These predictions are then compared with GFZ. At first sight the results seem reasonable, but many other details are needed to evaluate authors’ findings. For example, the comparison between Kp prediction and GFZ lacks a quantitative error estimation in terms of both intensity and timing. Furthermore, information about the hypothetical warning time is not provided. The article could be considered for publication only after major revisions. Specific comments are reported below.

Comment on References: Please, cite in parentheses when needed in order to avoid confusion with the main text. For example “To address this, the ESA Virtual Space Weather Modeling Center (VSWMC) has expanded its capabilities to allow the integration of a series of models for the purpose of forecasting Poedts et al. (2020)” should be “To address this, the ESA Virtual Space Weather Modeling Center (VSWMC) has expanded its capabilities to allow the integration of a series of models for the purpose of forecasting (Poedts et al. 2020)”.

**Our reply:** Thank you for your consideration, all of the efferences were edited as your suggestion.

Abstract – Please specify how the impact of the CMEs on Earth is evaluated in the work (e.g. Kp index) in order to better describe the work.

**Our reply:** Kp index index has value between 0 till 9 and the value larger than 5 means the storm which kp=5 determines minor storm, kp=6 moderate, Kp=7 strong, Kp=8 severe and Kp=9 extreme storm. In this work the highest value of the Kp is between 8 and 9 that means we have extreme storm.

Line 6 – “Comparative examination using data from the WIND and OMNI spacecrafts reveals that the EUHFORIA model offers a moderately precise depiction.” – OMNI is a web data service, not a spacecraft. Please modify.

**Our reply:** Thanks for your consideration, it was edited.

Lines 7-8 – “The study highlights that interactions of CMEs play a significant role in determining their impact on Earth, highlighting that their initial speeds, while similar, are less influential.” – This sentence, which summarizes the main result, is unclear. Please rephrase.

**Our reply:** Thanks for your attention. It was edited.

Line 53 – “which is anchored in two opposite polarities of the sun’s magnetism on its surface [...]” – magnetism -> magnetic field.

**Our reply:** It was edited.

Lines 136-137 – “One approach is the Wang-Sheeley-Arge model (WSA), which incorporates data from magnetograms to determine the plasma conditions at a distance of 0.1 AU.” – This statement is unclear. Isn't the WSA relation used to determine the radial velocity of the solar wind at the source surface from the expansion factors of open field lines? While the expansion factors (and the magnetic field at the source surface) are determined through the PFSS extrapolation from magnetograms. Please clarify and provide more details.

**Our reply:** The empirical model employed in EUHFORIA follows the path laid out by the Wang–Sheeley model (Wang & Sheeley 1990; Arge 2003) and the DCHB model (Riley et al., 2001). Namely, the solar wind speed is given as a function of the flux tube expansion factor f and the distance of the foot-point of the flux tube to the nearest coronal hole boundary d. The wind speed is thus determined completely by the properties of the global 3D coronal magnetic field, see Pomoell and Poedts (2018).

Line 143 – “[...] by using a method called Potential Field Source Surface (PESS) extrapolation [...]” – the correct acronym is PFSS. Please change.

**Our reply:** I have to apologize for that typo mistake. It was edited.

Lines 150-151 – “This sentence states that a finite volume numerical method and a constrained transport scheme are used to solve the ideal MHD equations with a polytropic index of 1.5, ensuring that the solenoidal criteria are met.” Please change “This sentence states” in something more formal like “In particular, a finite volume…[...]”.

**Our reply:** Thank you for your attention, it was changed.

Lines 276-277 – “EUHFORIA utilizes a straightforward approach that is based on the empirical equation for linear prediction of Kp, which was originally proposed by Newell et al. (2008)” – Which is the empirical relation? How is Kp of EUHFORIA calculated? Please provide more details.

**Our reply:**  Newell not only investigate the values of Kp but considers ten different magnetospheric state variables, among which both the Kp and Dst indices. It investigates 32 coupling functions, of which twenty are viscously related, and twelve are merging related solar wind-magnetosphere coupling functions. The term coupling function is used because these functions couple the Kp index to the interplanetary conditions.

Lines 280-281 – “The Kp index is computed by the model and presented as a time series file” -> “The Kp index is computed by the model and presented as a time series”. Remove the word “file” from the sentence. It’s not useful and misleading.

**Our reply:** Thank you for your attention, it was deleted.

Figure 9 – It would be useful for comparison to show Kp prediction and Kp index from GFZ in the same plot. This would be useful especially for comparing the timings of predicted Kp and GFZ. Furthermore it is strongly recommended to provide an error metric for this event, such as the root mean squared error (RMSE). Please provide these details.

**Our reply:** Thank you for your suggestion, it was applied.

Lines 302-303 – “Out of the various CMEs that happened during that specific time, only two were chosen. These two CMEs had distinct structures, one being a full halo CME and the other being a limb CME. “ Only two CMEs have been inserted into the simulation. Is this choice motivated by scientific reasons or only by technical limitations? It is important to specify that because, as stated in the next sentence (“These interactions between the CMEs could have had a notable impact on Earth’s magnetosphere and ionosphere.”), interaction between multiple CMEs could have a notable impact. Could other CMEs occurred in the time span between CME1 and CME2 interact with them?

**Our reply:** I added Table 1 with the CMEs information in the manuscript. All that 8 CMEs have inserted in our simulation. Because we had CMEs on 18 and 19 June that happened before the CME1 (which occurred on 21 June), but we did not have significant CMEs on 23 and 24 June before our second selected CME2, we considered that for CME1, we had the CME interaction, but this did not happen for the CME2. Then, we investigated the CME interaction effect for CME1 that affects its impact on Earth. Through the EUHFORIA simulation it was observed that there are no CME interactions for CME2.

Lines 327 - 330 – “The EUHFORIA numerical model’s time variations of the Kp index coincided with the observational GFZ results. This states that EUHFORIA has the capability to accurately determine and possibly forecast the impact of CMEs on Earth. Furthermore, due to the presence of several CMEs in the vicinity of CME1, it is possible that this anticipated severe storm is connected to the interaction of multiple CMEs.” How is it possible that, if there is a significant discrepancy in the estimated arrival time of the CMEs, the predicted KP is aligned (in time) with the observed one? This fact does not make sense to me. Please clarify.

**Our reply:** The observed data that were used for defining arrival time and predicted Kp are completely different. In the case of the observational arrival time it must be noted that speeds projected in the CDAW catalogue (https://cdaw.gsfc.nasa.gov/CME-list/) were used. But the observed Kp index is calculated from the K values or the geomagnetic recordings of 13 geomagnetic observatories.

Comment on “Conclusions”: The authors state that the model has the capability to compute and potentially forecast the impact of CMEs on the Earth, but nothing is said about the warning time of their predictions, i.e., computational time vs effective arrival of the CMEs. This would help to understand whether the model can potentially predict the impact of CMEs. Please provide these details/references (in addition to what is already there about the arrival times of CMEs).

**Our reply:** In discussion part we were explained computational arrival time by EUHFORIA and observational arrival time based on the speeds projected in the CDAW catalogue (https://cdaw.gsfc.nasa.gov/CME-list/). The second estimate is a rough approximation that does not consider the impact of drag or the interaction between CMEs as they travel towards Earth. These factors could explain the discrepancies observed. We determine that CME1 will reach the Earth in approximately 46 hours. Based on the speeds projected in the CDAW catalogue (https://cdaw.gsfc.nasa.gov/CME-list/) CME1 has a linear fit speed of 1366.1 km/s, meaning it will take around 30.49 hours to reach the Earth. In the CME2 situation, this distinction becomes notable. The estimated arrival time of CME2 using EUHFORIA results is approximately 70 hours, whereas using the linear fit speed of 1626.7 km/s, the estimated arrival time is around 26 hours. It can be inferred that how CMEs are launched is not particularly significant. Still, their interaction and movement in the heliosphere are the main factors determining their arrival time at Earth.