Review of *"The impact of stratospheric aerosol intervention on the North Atlantic and Quasi-Biennial Oscillations in the Geoengineering Model Intercomparison Project (GeoMIP) G6sulfur experiment"* by Jones et al.

This is an excellent and very well written paper. The model intercomparison study, which investigates the impact of stratospheric aerosol injection (SAI) on the North Atlantic Oscillation (NAO) as well as on the Quasi-Biennial Oscillation (QBO), emphasizes regional impacts of SAI and compares scenarios with SAI and climate change (G6sulfur) to scenarios only with climate change and no SAI (SSP245 and SSP585). This is exactly the kind of comparison which needs to be made and analyzed to evaluate a potential future deployment of SAI. To me, the highlight of the paper is figure 6 which underlines the potential danger of regionally exacerbated precipitation (e.g., in Iberia) due to a forced positive winter NAO.

I recommend this study for publication in ACP. I agree with the comments made by reviewer 1 and I think that they should be processed before publication. The same goes for my additional minor comments and questions below.

General Comment: Despite the wide use of the term «sulphate aerosol» in the geoengineering community, it is mostly used wrongly, as it is the case in this paper. A sulphate normally refers to a salt containing SO_4^{2-}, but not liquids. Thus, the term "sulfuric acid aerosols" is more appropriate since the aerosols consist of a H_2SO_4-H_2O solution.

Line 66: I recommend writing "correlated" instead of "associated", or do Zanardo et al., 2019 really show association?

Line 117-119: How can consistency be guaranteed here? Differences in radiative forcing do result in very different temperature responses across GCMs.

Line 120-129: The very different emission locations, especially differences in emission altitude, can cause significant differences in the distribution of the aerosol burden in the stratosphere and therefore very different SW cooling patterns as well as very different stratospheric heating patterns (e.g., Niemeier et al., 2009). How does this impact your results? This could be relevant, especially with respect to the QBO responses of SAI (see also Franke et al., 2021). This point should also be discussed in section 3.3.

Line 165: How does the NAO change in the SSP585 scenarios in the set of models considered in this study? The set of models in this study is different from the one in Tsanis and Tapoglou, 2019 (different set of models as well as model versions). How do they differ with respect to the NAO response?

Line 163-168: Doesn't G6solar (Kravitz et al., 2015) include the "confounding factor of different temperature" as well? The temperature difference is only due to solar constant reduction instead of SAI…

Line 168: You should make clear that the data referred to here is from your simulation and not Kravitz et al., 2015 as it was referred in the sentence before.

Line 184-198: This is very impressive. It would be great to see figure 6 also for temperature, not only for precipitation.

Table 1: The identifiers of the individual simulations are very long and confusing to distinguish. Could this be simplified?

References:

Franke, H., Niemeier, U., and Visioni, D.: Differences in the quasi-biennial oscillation response to stratospheric aerosol modification depending on injection strategy and species, Atmos. Chem., Phys., 21, 8615-8635, https://doi.org/10.5194/acp21-8615-2021, 2021.

Niemeier, U., Schmidt, H. and Timmreck, C. (2011), The dependency of geoengineered sulfate aerosol on the emission strategy. Atmosph. Sci. Lett., 12: 189-194. https://doi.org/10.1002/asl.304

Tsanis, I., and Tapoglou, E.: Winter North Atlantic Oscillation impact on European precipitation and drought under climate change, Theor. & App. Clim., 135, 323-330, https://doi.org/10.1007/s00704-018-2379-7, 2019.

Zanardo, S., Nicotina, L., Hilberts, A. G. J., and Jewson, S. P.: Modulation of economic losses from European floods by the North Atlantic Oscillation, Geophys. Res. Lett., 46, 2563-2572, https://doi.org/10.1029/2019GL081956, 2019.