Executive summary

1. What is this contribution about?

This contribution is about the optimization of COREAS simulations for the GRAND project.

2. Why is it relevant / interesting?

It contains a lot of work about the GRAND project which has not been done before.

3. What have we done?

We have done the first analysis of the atmospheric model of the GP300 site, and prepared the library with the best knowledge of GRND, we have developed three methods in terms of particle and radio simulations to test the adaption of CORSIKA7 for upward-going air showers by comparing with downward-going air showers, we have done the CoREAS-based SNR analysis with a testing layout of GP300.

4. What is the result?

It provides a representative atmospheric model for the GP300 site; it provides a large air shower library for the GRAND project which will serve in the next steps of the GRAND project; it has validated the adaption of CORSIKA7 for upward-going air showers; and it proved that it is difficult to find cosmic ray under 10^{16} eV with GP300, but might find some signal close to the center of the layout when the zenith angle is around 65°.