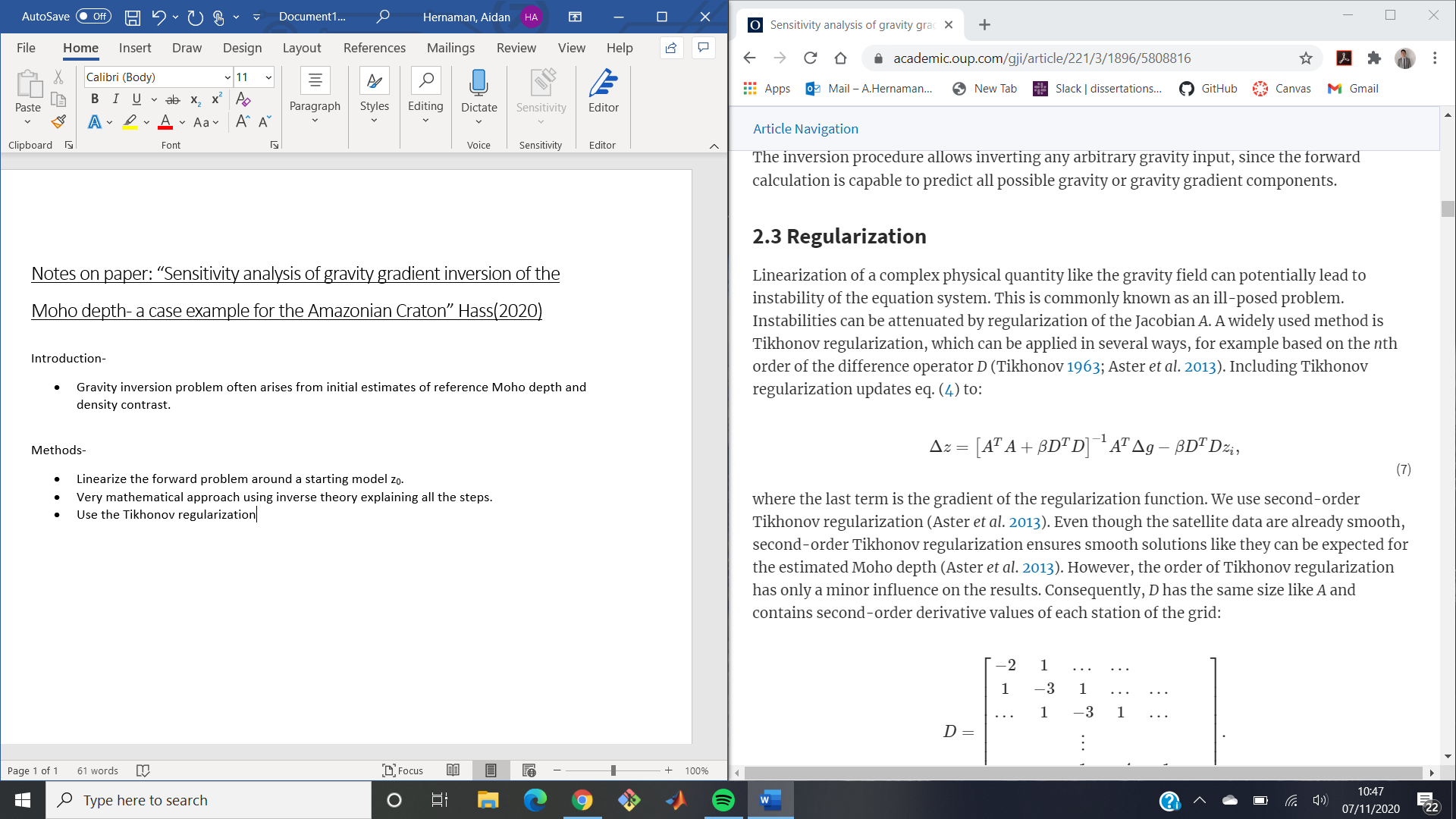
Notes on paper: “Sensitivity analysis of gravity gradient inversion of the Moho depth- a case example for the Amazonian Craton” Hass(2020)

Introduction-

* Gravity inversion problem often arises from initial estimates of reference Moho depth and density contrast.

Methods-

* Linearize the forward problem around a starting model z0.
* Very mathematical approach using inverse theory explaining all the steps.
* Use the Tikhonov regularization which will ensure smooth solutions like expected for the estimate Moho depth.
* Adopt approach of Uieda and Barbosa by using seismic measurements to constrain predicted Moho depth.

Synthetic examples-

* Generate synthetic fields based on an Airy-isostatic Moho depth.
* Need to select the right regularization parameter, so test different values of β for all components to explore the trade-off between gravity fit and Moho model fit.
* Use a variable density contrast based of seismological data and split into six tectonic domains, use increments of 50km for density.

Data-

* Use GOCE as initial data for the inversion, it represents the measured gradients at lower orbital phase height of 225km.

Inversion with satellite data-

* Some variations with the data when compared to seismological estimates.

Discussion-

* Results come out like Uidea17 model which should be predicted. Laterally variable density contrast helps to improve the fit to the seismic data.
* Density estimation issues with the Precambrian fold belts.
* Where tectonic domains vary on a small-scale result may be represented as incorrect.

Conclusion-

* Developed new method to invert gravitational component for the Moho depth, capable of a varying input height of the gravity field.
* Final Moho model is selected by the best fit with seismic constraints.
* Can produce a better model by refining tectonic domains to smaller bodies using different geophysical data or by expanding the lateral variable density contrast.