5.017 BC enhancement of glacier melting on Cerro Tronador: modeling and measurements.

Early Career Scientist

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Abstract:

The influence of Black Carbon (BC) on glacier melting is of great interest currently (*1*), but there are ongoing discussions on its magnitude, due to controversy on the appropriate methodology of simulation of this effect. Specially, there is a lack of sufficient experimental data regarding different physical and chemical processes involved in the aforementioned interaction (*1*, *2*). Hence, online modules that incorporate this effect in general atmospheric circulation models still provide diverging results.
I will show preliminary results of the implementation of an online coupling between BC deposition and glacier enhanced melting, into the atmospheric transport model CCATT-BRAMS (*3*). We have already validated a meteorological simulation of CCATT-BRAMS in the Argentinean Andes (*4*). I will describe the most relevant direct and indirect effects of BC deposition on ice and snow, and the weaknesses of the available models that we wish to improve. I will also show preliminary results of the field campaign in glaciers located in Cerro Tronador, Argentina, including measurements of surface albedo and BC, mineral dust and volcanic ashes concentration (surface and vertical profile). We will assess the differences on the BC concentrations determined with different techniques (reflectometry, thermal-optical methods and incandescence methods) considering the interference of other particles. We will use the experimental data to get an alternative estimate of the BC enhanced melting. Additionally, we will try to use these results to validate or adjust BC emissions, deposition, post-depositional processes, albedo and enhanced melting in CCATT-BRAMS.

References

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