

### **3.055 Experimental Campaign: Measuring black carbon concentrations in exhaust plumes from heavy duty trucks driving through the Andes Cordillera .**

Early Career Scientist

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Abstract:

Emissions from particle matter generated from vehicle activities in high altitude zones (around 3.000 mts.) could increase black carbon deposition over snow and glaciers. A preliminary campaign measuring black carbon concentrations at Los Libertadores highway in Los Andes, Chile, and associated to international freight transportation has been performed during four days in October 2015. A vehicle outfitted with a mini-aethalometer Model AE51 was used, together with a GPS device, to follow heavy duty trucks simulating their driving patterns. This methodology is being tested for a larger campaign to be carried out in the same area, scheduled for July 2016. Differences in black carbon measurements were found from trucks driving to and from the international border, suggesting that diesel quality from Argentina, Bolivia, Paraguay, Brazil and Chile might produce different emission levels. Also, loaded trucks driving uphill show maximum BC levels registered during the campaign. A total of 40 trucks were followed in total, both driving cycles and black carbon concentrations were measured simultaneously. Preliminary results show peaks of 400,000 ng/m<sup>3</sup> on trucks operating uphill, background average in zones with no population show values between 2,000 to 3,000 ng/m<sup>3</sup> and urban highway values were in average 20.000 to 30.000 ng/m<sup>3</sup>. Substantial differences on truck exhaust "plume" in relation with other vehicles were observed. Finally, GPS tracking allows correlating emissions results and driving behavior through the Vehicle Specific Power (VSP) methodology. This correlation will be used to model emissions from trucks only knowing their driving pattern, allowing estimating emissions accurately for a longer period of time.