Ceilometer Measurements from The University of Western Ontario of Smoke from the Extraordinary Fires of 2017 in Western Canada

Background:
The summer of 2017 saw many fires in Western Canada. Smoke from these fires was transported by winds over to London and was measured using a Lufft CHM15k ceilometer which was installed at the Cronyn Observatory of The University of Western Ontario.

Methods:
The cloud base height can be calculated by the time taken for the backscatter signal to reach the transmitter while the backscatter effects can be used to determine the atmospheric structure using the principle of light detection and ranging (LiDAR).

Results:
Smoke particle concentrations over London, Ontario were observed within 72 hours of the fires taking place in the west. The smoke plumes were frequently visible from late May to late October 2017 with smoke concentrations peaking between August and September.

Discussion and Conclusion:
Our measurements will help to validate estimates of smoke dispersal from the fire sources by testing whether transport predictions match both the London Canada as well as the European measurements.

Interdisciplinary Reflection:
The ceilometer activity aims at developing the capability to make continuous measurements of forest fire smoke, volcanic ash and/or smoke plumes which can affect aviation traffic and cause health and safety risks.