Contribution ID: **26** Type: **oral presentation**

Mountain and valley winds and their implications on processes controlling air quality

Tuesday 7 November 2023 11:05 (15 minutes)

Processes controlling pollutant dispersion over complex terrain are much more complicated than over flat areas, as they are affected by atmospheric interactions with the orography at different spatial scales. In particular, thermally-driven daily-periodic winds produce circulation patterns and stability situations which are quite difficult to reproduce by numerical weather prediction models in their operational settings. The basics of these processes will be briefly reviewed, along with open questions and challenges to our capability for better understanding and representing atmospheric processes controlling the fate of pollutants over mountainous areas, as well as possible solutions.

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Session Classification: Air Pollution and Health Effects

Track Classification: Air Pollution & Health Effects