



Lightning in the eastern Alps: typical tracks and diurnal, seasonal and weather type dependence

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Seven years of lightning data from the ground-based ALDIS network trace the dependence of lightning activity on time of day, season, and weather type and identify typical weather-type dependent storm tracks.

Lightning season starts in late spring, mainly in the northern forelands, and ends in early fall, mainly on the south side of the Alps. Snow coverage constrains the regions where lightning storms form. Overall, strongest source regions are mid-altitude mountain ranges and the Alpine rim.

Diurnally, convection and lightning start mostly on south-east facing slopes along the Alpine rim. In the evening and during the night thunderstorms move off the mountains into the forelands.

During weather situations with weak mid-tropospheric flow, lightning remains stationary at the main source regions. For stronger flow, preferred lightning regions during cross-barrier flow are on the downstream side due to destabilization of the orographic mountain wave. For along-barrier flow, they are on the cyclonic side of flow around the Alps.