

# **A Python package to derive gridded synoptic circulations**

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## **Abstract**

Synoptic surface circulations strongly help determine atmospheric variables' day-to-day behaviour over a region. These patterns can influence longer-lasting events like heatwaves, droughts, and floods if some dry or wet circulations persist over anomalous long periods. Several classifications have been developed to group large-scale circulations over different world regions. However, many of them have been constrained to applications limited a one area at a time. To overcome this constraint, an open-source python package has been developed to automatically derive the large-scale atmospheric patterns based on the original Jenkinson-Collison automated classification. This tool lets users input a mean sea level pressure dataset (e.g., Reanalyses, Global Climate Models, or ensemble forecasts) to automatically retrieve a set of 27 gridded surface synoptic circulations. In addition, the first version of the Python tool offers the opportunity to visualise the surface patterns and to work with a reduced version of 11 groups that can be further applied to study the effects of the large-scale configurations on sub-seasonal or climatic time scales.