Meteorological conditions influence thermal stress which plays an important role in different kinds of human activities, such as: sport activities, tourism, hiking, outdoor occupations, health prophylactic etc. Thermal stress is influenced by all environmental factors, from geographical such as latitude, distance from sea/ocean and altitude to atmospheric circulation factors – all weather or climate system factors. Very important is not only to assess the actual conditions of thermal stress but also to explain how and why they are changing in time and space.

Mountain regions are very sensitive areas because of a wide list of factors that influence the actual weather conditions. Mountains weather is influenced by the exposition of ridges and slopes to predominated winds depended on local and regional atmospheric circulation patterns. Thus, mountains thermal stress features besides Köppen-Geiger Climate Classification (KGCC) will be considered also from the perspective of orientation to the main mountain ranges and altitude more specified (based on altitudinal belts). Also, we are going to find out altitudinal thermal stress zonation in the Alps and Carpathian Mts.

We will conduct unique, comparative analyses to address important and unresolved research questions in the bioclimatology (atmospheric sciences), linking local-level thermal stress with regional-level geographical factors, KGCC and altitudinal zonation. In particular, within the project we will contribute to the solution of the following research questions:

(**Q1**) how the features of thermal stress in Europe and northern Africa are related to geographical factors in general; and what are the thermal stress characteristics of each type and subtype of the Köppen-Geiger climate classification?

(**Q2**) what altitudinal climate zones (altitudinal belts) can be distinguished in the Carpathians based on Köppen-Geiger Climate Classification? For the Alps, a classification of altitude zones already exists.

(**Q3**) how thermal stress in the Alps and the Carpathians depends on geographical factors such as grid points location in relation to the main mountain ridge and grid points elevation above sea level; and what are the thermal stress features of each altitudinal belt?

(**Q4**) which altitudinal thermal stress zones can be distinguished and classified and how they are related to altitudinal climate zones (altitudinal belts)?

Therefore we expect that the project will have a very high impact on the research field and discipline because it will answer unresolved questions. The results will be presented in publications and at international conferences. We expect also important outcomes from the point of view of future studies which will take into account assessment or applications of KGCC in terms of thermal stress for the whole world, altitudinal belts based on KGCC to other mountains ranges along with their future predictions.