Popular description of the project
"New model of evolution of Earth's non-cratonic subcontinental lithospheric mantle"

Lithospheric plates form outermost, rigid part of Earth. The plates are binary, they consist of the crust and underlying mantle, which are separated by seismic Moho discontinuity. Lower, mantle parts of lithospheric plates consist of peridotites, which occur between Moho and plastic asthenosphere. The rocks of lithospheric mantle are not accessible for direct observations, and we gather the knowledge about them from fragments of the rocks ("xenoliths") entrained in the erupting basaltic lavas. Thanks to widespread occurrences of recent and fossil basaltic eruptions containing Earth mantle xenoliths, it is possible to recognize mantle variation at the global scale.

It was traditionally considered that lithospheric mantle originated by partial melting of readily-melting components and their extraction at early stages of Earth evolution. In recent years it was discovered that re-enrichment of lithospheric mantle in readily-melting components due to percolation of asthenosphere-derived melts may form rocks of "primary" composition. This process was first described in the so-called "orogenic massifs", which are tectonically exhumed mantle fragments. Subsequently re-enrichment process was described in xenoliths by the applicant. The proposed project aims at recognition what is the extent of this kind of re-enrichment of lithospheric mantle beneath two different orogens (Variscan orogen in Europe and Pan-African orogen in Cameroon in Africa). Basing on this knowledge, the applicant intends to propose a new model of evolution of continental parts of lithospheric plates including the re-enrichment of their parts in the readily-melting components.