

The melting processes and melt evolution beneath oceanic spreading axes are still poorly understood. Short-lived U series nuclides add unique dynamic and temporal insights that help to understand these processes in more detail. We propose to study the U, Th, and Ra isotopic compositions of zero-age MORB samples from the slow-spreading Mid-Atlantic Ridge between 6 and 11°S. This part of the spreading axis shows large variations in axial depth, crustal thickness and samples melts with significant variations in major and trace element geochemistry as well as Sr, Nd, and Pb isotopic composition. The existing data indicates a complex interplay of variations in mantle sources, binary mixing and degree of magma differentiation during melt ascent. In the first year we suggest to determine U, Th and Ra isotope compositions of fresh young samples along the axis and from young (<200,000 yrs) near-axis seamounts to evaluate the depth and extent of melting, the mantle composition, porosity and upwelling rate and the mixing processes along a propagating ridge segment. In the second year we propose to investigate the timing of magma evolution and eruption processes on this spreading axis on the basis of U series isotope data and stratigraphic mapping and sampling of selected volcanic structures of the working area.