



Detrital zircons (U-Pb and Lu-Hf) and host hemipelagic sediments (Pb-Sr-Nd-Os) from the Polar Arctic

Igor Kapitonov, Boris Belyatsky, Eugeny Petrov, and Sergey Sergeev

A.P. Karpinsky Russian Geological Research Institute, Saint-Petersburg, Russian Federation (vsegei@vsegei.ru)

We studied deep-sea sediments from 6 sampling sites on the steep slopes of seamounts that accumulate during the last one million years. The goal of the study - to characterize the bedrock, which are coming to the surface from the overlying deposits for most of these steep slopes and weathering give talus deposits accumulating at the foot of the slopes. The result proved to be similar enough for heavy fraction of all sediment columns spaced along the Alpha-Mendeleev Ridge on a 450 km. This suggest provenance similarity, which can be achieved either by erosion of the same rocks composing this ridge or by continental origin of material. We conducted control sampling of deep-water pelagic sediments in several remote places and held various positions with respect to the morphological ocean structure: on the flatten top surface of the deep-water ridge, on the bottom surface of the Amundsen Basin, 100 km to the west of the Lomonosov Ridge, at the Geophysicists Spur from the eastern side of the Lomonosov Ridge, and from the Laptev Sea. There are five control samples, which showed some local differences in the composition and distribution of zircon ages, with a total general similarity of these distributions. This fact indicates move the character of precipitation, as on the surface elevations and depressions in the sediment at the expense of local erosion of bedrock can not be formed. One of the sources of the Arctic Ocean sediments are traditionally considered «dirty» sea ice carrying material from the Canadian Archipelago, which are moved into the central part of the ocean due to Bofourt Gear flow. However, the distribution of zircon ages, revealed in the sediments, differs significantly from similar distributions for detrital zircon of Arctic coast of Alaska, the Canadian Archipelago, Greenland, Europe (Baltic Shield) and North America. But there are a lot more similarities with the zircon ages distributions typical for Asian continent, excluding China and India. However, a direct resemblance to the Permo-Triassic and Jurassic sandstones of coastal areas of the Arctic, we also do not see. Another factor in the formation of deep marine sediments is fluvial transference. The total input of the Arctic rivers reaches about 1×10^6 tonnes per year. When comparing the characteristics of detrital zircons of different river systems, we see that the similar is the distribution of zircon ages from the deposits of the Lena, Yenisei and Yana-Indigirka. Given that the Laptev Sea is the main source of «dirty» sea ice, carried by Transpolar Drift in the central part of the Arctic Ocean, detrital zircons from sediments of Lena river, which is characterized by the highest among Arctic rivers discharge, apparently, ensure the formation of the heavy fraction of hemipelagic mud in a large deep-water area of the Arctic Ocean, including the polar region. The observed variations in local distribution of zircon ages in the studied sampling points do not exclude the presence of local material, but to determine its share and establish with certainty the composition further research is required.