Methods used for Radium measurements during ARK-XXII/2

Sampling
Surface water samples (150-300L) from the seawater intake (7m depth) were filtered over 1-µm polypropylene cartridges, passed over MnO₂ fibre at a flow rate of at most 1 L/min (MOORE, 2008)

Analysis

224Ra: samples were counted for 224Ra with delayed coincidence scintillation counting (MOORE and ARNOLD, 1996). For the calculation of counts due to 224Ra we used the chance coincidence correction, not the alternative procedure based on total counts (MOORE, 2008). The expected error is 8-14% (GARCIA-SOLSONA et al., 2008).

226Ra and 228Ra: In the home laboratory, Ra was leached from the fibre (ELSINGER et al., 1982), coprecipitated as BaSO₄ (CUTTER et al., 2010) and counted with gamma spectroscopy for 226Ra and 228Ra (MOORE, 1984).

228Th
We used 224Ra as proxy for the activity of 228Th. Beyond the reach of the unsupported 224Ra from its shelf source, 224Ra must be in equilibrium with its parent 228Th.

Other data
Salinity, transmission from CTD bottle data
Fraction pacific water (fₚ) and fraction river water (fᵣ) from Bauch et al. (2011).


