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 MnO_2 fibre at a flow rate of at most 1 L/min (MOORE, 2008)

Analysis

^{224}Ra: samples were counted for ^{224}Ra with delayed coincidence scintillation counting (MOORE and ARNOLD, 1996). For the calculation of counts due to ^{224}Ra 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).

^{226}Ra and ^{228}Ra: In the home laboratory, Ra was leached from the fibre (ELSINGER et al., 1982), coprecipitated as $BaSO_4$ (CUTTER et al., 2010) and counted with gamma spectroscopy for ^{226}Ra and ^{228}Ra (MOORE, 1984).

^{228}Th

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

Other data

Salinity, transmission from CTD bottle data

Fraction pacific water (f_p) and fraction river water (f_r) from Bauch et al. (2011).

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