



## **<sup>14</sup>C excess in deep-sea sediments porewater driven by diffusion [Southeast Mediterranean]**

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**ABSTRACT:** Core profiles in the deep SE Mediterranean Sea revealed a significant  $\Delta^{14}\text{C}$  excess in the total dissolved inorganic carbon (DIC) of porewater as compared to the  $\Delta^{14}\text{C}$  of the sediments, below the bioturbation zone down to core bottom ( $>2$  m). The main observation was that the age difference between porewater and sediments, as calculated from the excess, was not constant but rather increasing with depth. The porewater apparent age was younger by 10% than the age of the sediment at the core top and gradually became younger by about 70% at the bottom of the core. Flux calculations and mass balances of the chemical and isotopic data suggest that this  $^{14}\text{C}$  excess stems from a downward diffusive flux of  $95 \pm 15$  atoms of  $^{14}\text{C}\text{DIC m}^{-2} \text{ s}^{-1}$  from the bioturbation zone and overlying bottom water into the sediment. The  $^{14}\text{C}\text{DIC}$  flux is opposite in direction to the DIC flux out of the sediment. It is suggested here that the  $^{14}\text{C}\text{DIC}$  flux may severely interfere with age determination of small submarine "brine lakes" formed in the deep Mediterranean. In addition, the  $^{14}\text{C}$  excess should show up in authigenic carbonate phases precipitating within the sediment and, hence, may serve as a tool to identify the extent and duration of authigenic carbonate precipitation.

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