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Analysis of 14C radioactivity in seawater of Beibu Gulf, Guangxi, China, using GXNU-AMS

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After the Fukushima nuclear accident in Japan, the safety management of nuclear power has been emphasized by various countries, while the radioactivity levels in the environment surrounding nuclear power plants have also received public attention. Studies have shown that the persistence of nuclear wastewater containing long half-life radiocarbon (also known as 14C) in the sea can affect marine ecosystems and ultimately harm human health through the hydrosphere-biosphere circulation, which highlights the importance of monitoring and assessing 14C in the marine environment. However, monitoring of fluctuations in 14C levels in the marine environment around nuclear power plants in China remains unpublished. Here, we used GXUN-AMS to evaluate 14C/12C ratios in seawater samples from several stations in the offshore waters of Beibu Gulf, Guangxi (108.1-109.1E), and to assess radioactivity in seawater.

It was found that one station showed a high value of PMC (Percent Modern Carbon). More specifically, the PMC at this station was 183.0 ± 1.0. Subsequently, several other stations showed subtle fluctuations, i.e., PMCs between 89 and 101. By investigating and exploring the station with the highest PMC, we found that the perturbed level of 14C activity at this station may be affected by the combination of the nearby nuclear power plant and the winter currents in the Beibu Gulf. In summary, we do not find any abnormality in the 14C activity level in the offshore waters of Beibu Gulf, Guangxi, China, due to the discharge of nuclear wastewater from Japan.

Student Submission

Yes

Primary authors: ZHANG, Guofeng (College of Physics and Technology, Guangxi Normal University, Guilin, Guangxi 541004, China); OUYANG, He; QI, Linjie (GUANG XI NORMAL UNIVERSITY); SHEN, Hongtao (Guangxi Normal university); LIU, Wenqiao (Guangxi Normal University); HUANG, Xinya (Guangxi Normal University); HAN, Xinyi (College of Physics and Technology, Guangxi Normal University, Guilin, Guangxi 541004, China); CHEN, dingxiong

Presenter: OUYANG, He

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