

## ***Interactive comment on “Determination of plutonium isotopes in marine sediments off the Fukushima coast following the Fukushima Dai-ichi Nuclear Power Plant accident” by W. T. Bu et al.***

**Anonymous Referee #1**

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This paper measured Pu isotope concentrations and isotope ratios in sediments collected near FDNPP at the western Pacific as well as in estuarine sediments of eastern Japan. And it concluded no detectable Pu contamination originating from the FDNPP accident injected to that region during the year since the accident. This paper presented the good quality of data enough for approaching the reliable conclusion. And further this document was well structured and well written. However, the conclusion of no detectable Pu contamination from FDNPP accident could be misunderstood to be negligible Pu discharge from FDNPP accident even if there have been reports of Pu signals from the FDNPP accidents in soils and settling particles. The authors presented the evidences such as similar inventory of Pu to those before accident and negligi-

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ble  $^{241}\text{Pu}$  in sediments. And, using two end-members of global fallout and PPG, the contribution of PPG was estimated based on  $^{240}\text{Pu}/^{239}\text{Pu}$  ratio. Since Pu could be recycled within the water column, the amount of deposited Pu should be lower than that of discharged Pu. And since total discharged Pu quantity from FDNPP accident would be much lower than total amount deposited for past 48 yr, it would be difficult to identify the signals of Pu from FDNPP accident with inventory data. For  $^{240}\text{Pu}/^{239}\text{Pu}$  ratio, PPG and FDNPP showed similar values, 0.36 and 0.303–0.330, respectively. And thus, it is also difficult to differentiate the origin of Pu from FDNPP accident with PPG. In conclusion, with Pu activity and isotope ratios in deep sea marine sediments, it seemed to be difficult to identify the contribution of Pu from FDNPP accident.

2. Specific comments : 1) p. 649 24 lines; organic matter content → ignition loss The weight loss by the ignition has often been used for organic matter content. However, it includes lattice water as well as organic matter, especially for fine-grained marine sediments. So, it is suggested that the ignition loss should be used instead of organic matter. 2) p. 651 15~22, the concentration of  $^{239}+^{240}\text{Pu}$  activity in . . . . . from 0.003 to 1.191 mBq/g → the values are different from those in Fig.1 caption. 3) p. 652 4 lines, its marginal seas is given → its marginal seas in the literatures (references) is given 4) P. 655 24lines ~ p. 656 9 lines, organic matter content → ignition loss The description for the relationship of Pu with organic matter seemed to be useless because there were little general relationships. 3. Technical comments: 1) p. 659 1line, hypothesize → hypothesis 2) p. 660 eq. 3 RB → RP

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