



Long-term transport and dispersion of ^{137}Cs released into ocean off Fukushima nuclear accident

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In the following days after the Fukushima nuclear accident which happened in 11th March 2011, significant amounts of radioactive materials (^{131}I , ^{134}Cs and ^{137}Cs) had been leaking into the terrestrial and marine environments. The radionuclides model was used to study the distribution of the ^{137}Cs in the Pacific and the Indian Ocean released from the Fukushima accident. The simulation on the distribution of ^{137}Cs agrees well with the the observed profiles in the 9th November 2011, which proved the validity of the model. In the first year of our model run, the ^{137}Cs is carried eastward by the Kuroshio and its extension, spreading southward and northward meanwhile. Four or five years after the accident, the ^{137}Cs reaches the US coast with the surface waters of the Pacific Ocean; its concentration is no higher than 3 Bq/m^3 . Ten years after the accident, all the North Pacific Ocean is labeled with the ^{137}Cs from the Fukushima. The concentration is less than 1 Bq/m^3 at that time. Thirty years after the accident, the concentration of ^{137}Cs in both the Pacific and the Indian Ocean is below 0.1 Bq/m^3 . Since the spreading path of ^{137}Cs from the Fukushima nuclear accident is just the migration route of the Pacific tuna, a kind of fish inhabit the western and eastern North Pacific, it may cause radioactive contamination to the fish. In the offshore seas of China, the ^{137}Cs from Fukushima nuclear accident is very low ($<0.2\text{ Bq/m}^3$).