

High Precision Pb Isotopes Reveal Recent Changes in Tropical Pacific Pb Sources

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In the upper waters of the Peru-Tahiti US GEOTRACES East Pacific Zonal Transect (GP-16) west of 110°W, there is a fork in the $^{208}\text{Pb}/^{206}\text{Pb}$ vs. $^{206}\text{Pb}/^{207}\text{Pb}$ relationship. The upper fork is found in waters shallower than 140m, and the lower fork is seen in deeper thermocline waters. The upper water branch overlays recent near-surface time-series samples from the HOT station near Hawaii (22.75°N, 158°W) during the past 20 years and extrapolates towards recent Chinese aerosols. A related trend is seen in atmospheric aerosols from Singapore (1°N, 108°E), where a southeast monsoon trend extrapolating towards the deeper thermocline GP-16 trend is displaced during the northwest monsoon with a trend towards higher $^{208}\text{Pb}/^{206}\text{Pb}$ Chinese (where $^{206}\text{Pb}/^{207}\text{Pb}$ is greater than 1.152). We propose that the fork in the GP-16 Pb isotope data represents a temporal shift in the dominant aerosol Pb source away from older sources (aligned between mainly U.S./Ethyl – Australian/Octel endmembers) to more recent Chinese aerosols with a higher $^{208}\text{Pb}/^{206}\text{Pb}$.