# Os isotopic profile in the water column of the northern Bay of Bengal

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The variation of the Os isotopic composition over time in the ocean waters is very large and span over almost one order of magnitude [1]. At the opposite the spatial heterogeneity has so far not been evidenced at the present level of precision of the measurements which is ca 0.5-1%. The present work presents an investigation of possible influence of the large input of very radiogenic Os from the Ganges river on the composition of the local ocean. The samples are regularly distributed over the 2700m of the local ocean depth about 350 km south of the Ganges estuary.

The analytical method used the chemical separation procedure described by Levasseur et al [2] coupled with a new mass spectrometric method using the "Thermo Platform"$^{R}$ multichannel ion counter system [3]. Os amounts down to 30 fg can be analyzed with significant precision using this procedure. Hence about 40 mL of seawater are used for each single analysis.

**Results:** The isotopic composition of Os is uniform over the full range of depth and the value of $^{187}Os/^{188}Os$ of 1.042 is in agreement with former measurements carried out in the open ocean [2, 4]. By contrast the Os concentration increase by 30 % with depth to reach a value at about 1000m of 10.6pg/Kg close to the results obtained for the deep ocean far from the coasts. Salinity data available in the same set of water samples show a similar behavior but with smaller amplitude of about 3% over the top 100m of depth .

**Discussion**: If the decrease in concentration would be attributed to dilution by soft water from the Ganges river the isotopic ratio of Os in the mix should be measurably more radiogenic than the seawater even with significant Os loss in the estuary[5]. Our conclusion is that the observed dilution observed salinity is related to the heavy rainfall undergone by the area. The larger depletion of Os concentration in the top 1000m is more probably related to subtraction by biogenic activity followed by removal by precipitation.

[1] Pegram & Turekian (1999) Geochim.Cosmochim.Acta **63**,4053-4058. [2] Levasseur *et al.* (1998) Science **282**, 272-274. [3] Birck *et al*. (2016) Thermoscientific Application Note 30355. [4] Gannoun & Burton (2014) JAAS **29**, 2330-2342. [5] Levasseur *et al.* (2000) **177**, 227-235.