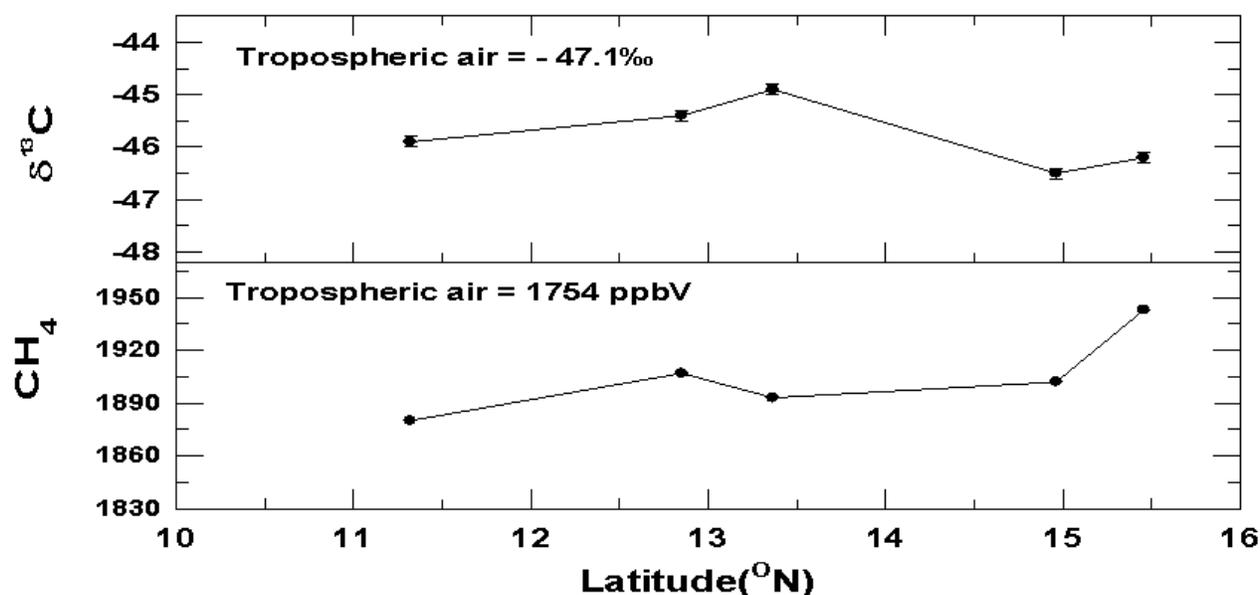


## Preliminary Studies of Carbon Isotopic Composition of Methane in the Marine Atmosphere Over the Arabian Coast.

D.K. Rao and R.A. Jani

Physical Research Laboratory, Ahmedabad, India; 91-0792-6314261, E-mail: karmesh@prl.res.in

Systematic air sampling has been done on board the ship 'Sagar Pachmi' in the coastal region of Arabian Sea along the cruise track from Kochi to Goa during November 2010. Ambient air was collected into 10L SS cylinders at 7bar pressure from a height of ~5 meters above the sea surface at different latitude intervals. The carbon isotopic compositions ( $\delta^{13}\text{C}$ ) were measured using dual inlet GEO 20 IRMS. Methane ( $\text{CH}_4$ ) concentrations, as well as its  $\delta^{13}\text{C}_{\text{VPDB}}$  values, in all of these samples are presented in Figure 1. The  $\text{CH}_4$  concentrations are more than that of tropospheric values (1775 ppbV) and the excess methane above tropospheric value is calculated to be ~ 7 to 11%. In general,  $\text{CH}_4$  concentrations in the marine atmosphere are related to emissions from the sea due to upwelling which brings methane rich water to the surface. During sample collection of three samples, the wind direction was NE and there is an increase of  $\text{CH}_4$  concentrations with increasing wind speed. Hence, the data suggests that excess methane must have come from the land and out over the ocean surface. The measured values of  $\delta^{13}\text{C}_{\text{VPDB}}$  of  $\text{CH}_4$  in these samples are enriched compared to that of tropospheric value (-47.1‰) which indicates that the excess methane is thermogenic type and, most likely, the methane must have come from land.



**Figure 1.** Latitudinal variation of  $\text{CH}_4$  concentration (ppbV) and  $\delta^{13}\text{C}_{\text{VPDB}}$  (‰) in air samples collected on board the ship "Sagar Pachmi" during November 2010.