Do correlative relationships between atmospheric concentrations in short-term variations at Hateruma reflect continental fluxes?

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The National Institute for Environmental Studies/Center for Global Environmental Research (NIES/CGER) has been carrying out in situ measurements of atmospheric trace gases, including CO2, CH4, N2O, CO, and H2 at Hateruma Island (lat 24N, long 124E). The observation at Haterum is rather appropriate to detect the signals of the emissions from the Asian continent because the island is located downwind of the continental source regions especially during the period from November to April. During this period, almost all the above species show significantly elevated and correlative variations with synoptic time scales. The slope of correlation plots between species pairs in such short-term variations may reflect the ratio of the individual emission strengths. We make correlation analyses for above 5 species and examine the temporal changes in the slopes of the correlation plots. The results show, for example, that the slopes of the correlation plots between CO2 and CH4 (CO2/CH4) increased by about 20% for the period of 1999-2006, suggesting the increase in the continental CO2 emission relative to the CH4 emission. This result seems to be consistent with the recent rapid increase in the fossil carbon emission from China.