Atmospheric motion studied from surface concentrations of cosmogenic beryllium-7

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Be-7 radionuclide (half life 53.3 days) is produced by galactic cosmic ray interactions in the upper atmosphere (cosmogenic origin). Approximately 70% of Be-7 is produced in the lower stratosphere and the remaining 30% in the upper troposphere. Present measurements of the surface concentrations of Be-7 in Tokyo (Pacific Asian region) in 2002-2005 exhibited the seasonal variations with enhancements in spring and autumn. We discuss the possibility of the stratospheric-tropospheric air mass exchange caused by a pair of traveling anticyclone and extratropical cyclone that passes over Japan in spring and autumn with a period of a few days.