Cloudiness anomalies and El Nino effects

A.V. Chernokulsky
A.M. Obukhov Institute of Atmospheric Physics RAS, Moscow, Russia
chern_av@ifaran.ru

Effects of El Nino on cloudiness from ISCCP data (Rossow and Duenas, 2004) in periods 1983-2005 years are estimated. Most significant differences in cloudiness are noted over tropical and equatorial latitudes in the eastern part of the Pacific Ocean in December-January-February (Fig. 1) (Mokhov and Chernokulsky 2003; Chernokulsky and Mokhov, 2006). Positive anomaly in this region reaches 0.4 in El Nino years (years with the largest positive anomalies of Nino 3 SST (5°N-5°S 150°W-120°W) (Rayner et al, 2003)). At the same time about 2/3 of these changes are related to the changes in cirrus and cirrostratus clouds (Fig. 2) contributing to the greenhouse effect. The mutual dynamics of temperature and cloudiness in this region should lead to the positive feedback.

There are negative cloudiness anomalies in the equatorial latitudes in the western part of the Pacific Ocean and in the eastern part of Indian Ocean. Cloud amount decreases in El Nino years by 0.1-0.2 and depends basically on changes in cirrus and cirrostratus clouds.

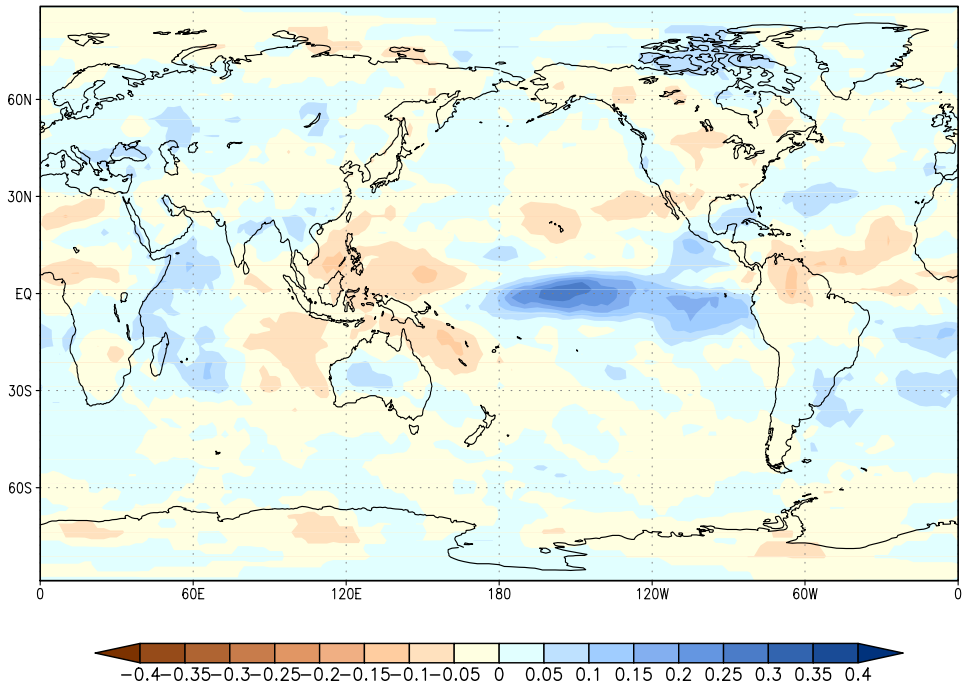

Fig. 1 Difference for total cloudiness in December-January-February between 5-year-means for years with the largest positive anomalies of the Nino 3 SST (1986-87, 1991-92, 1994-95, 1997-98, 2002-03) and neutral years (1989-90, 1990-91, 1992-93, 1993-4, 2004-05).

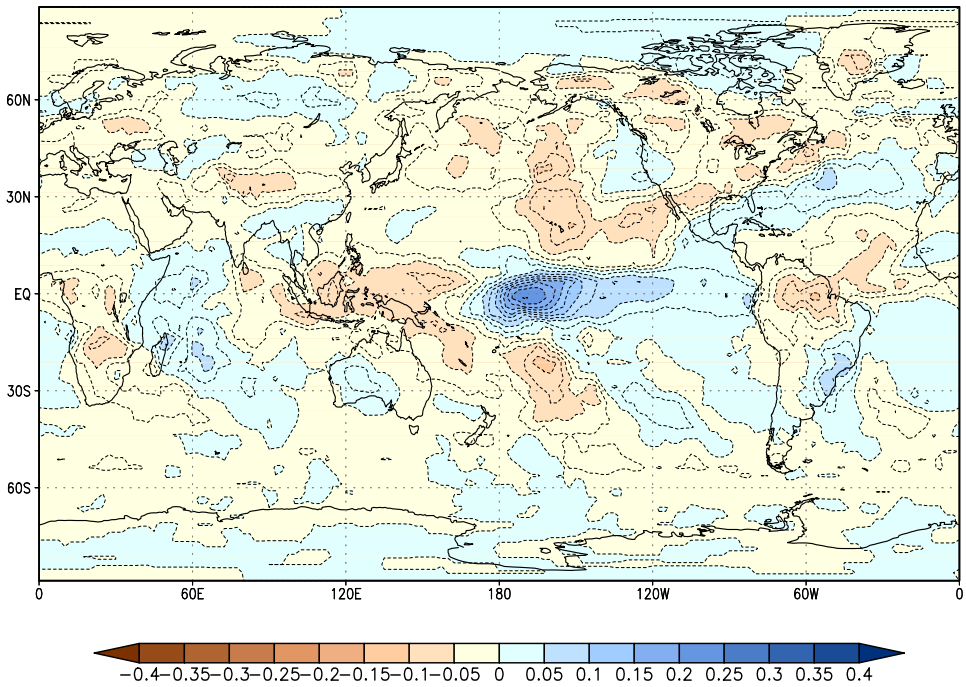

Fig. 2 Difference for cirrus and cirrostratus clouds in December-January-February between 5-year-means for years with the largest positive anomalies of the Nino 3 SST (1986-87, 1991-92, 1994-95, 1997-98, 2002-03) and neutral years (1989-90, 1990-91, 1992-93, 1993-4, 2004-05).

This work was partly supported by the Russian Foundation for Basic Research, Programs of the Russian Academy of Sciences and by the Russian President Scientific Grant.

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