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Effective atmospheric angular momentum functions derived from ECMWF reanalysis ERA-40

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Angular momentum exchanges occur between fluid and solid components of the Earth inducing Earth's mantle orientation variations. Among these exchanges, the contribution of atmospheric wind and surface pressure is derived from meteorological observations assimilated in the ECMWF Re-Analysis ERA-40 global circulation model. Effective atmospheric angular momentum functions are computed from the ERA-40 geopotential, pressure, temperature and winds three-dimensional model-levels fields. The validity of commonly used computational assumptions are tested against nowadays accuracy requirements when computing the effective atmospheric angular momentum functions and investigating Earth's rotation excitation.