A Lorenz/Boer energy budget for the atmosphere of Mars from reanalysis

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We calculate a Lorenz energy budget for the martian atmosphere from Mars reanalysis data derived from Mars Global Surveyor data for Mars Years 24 - 27. We present global, annual mean energy and conversion rates and compare these to Earth data. While mean values per unit area are consistently lower for Mars, due to the thinner martian atmosphere, the directions of most energy conversion are similar to Earth. Further seasonal and hemispheric decomposition reveals a strong influence of the cross-equator Hadley circulationon the movement of atmospheric energy on Mars. On separating the diurnal timescale contributions to the energy reservoirs and conversions suggests that thermal tides make significant contributions to conversion terms and eddy kinetic energy in the martian atmosphere, especially during planet-encircling dust storms.