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Gaining insights into space-time scales of the secular variation of the geomagnetic Y component at the core-mantle boundary

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To identify the dynamical processes going on in the upper region of the fluid outer-core, it is necessary to study the temporal and spatial changes of the geomagnetic field and of its secular variation.

In that context, we take advantage of different already published field models at the Earth' surface, covering the time span 1980-2000. We focus our study on the geomagnetic impulse around 1991.

The quantity dY/dt at the CMB is determined by the method of non-harmonic downward continuation assuming a mantle conductivity model (weakly conducting mantle, highly conducting layer above the CMB).

We then achieve a wavelet analysis to see the possible existence of specific motions' scales on regional and global scales.

Core-surface flow accelerations are derived from degree-limited sets of Gauss coefficients by fluid flow inversion in tangentially geostrophic approximation.

We study the corresponding maps jointly with the ones obtained for the temporal behavior of the '1991 jerk' at the CMB.

The spectral properties of the 'jerk bend' around the occurence time are also derived.

We discuss the results and extract the more robust features of the motions at the core-mantle boundary we obtained.