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Pseudo-outcrop visualization of borehole images and core scans. (English) Zbl 1406.86045
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Summary: A pseudo-outcrop visualization is demonstrated for borehole and full-diameter rock core images to augment the ubiquitous unwrapped cylinder view and thereby assist nonspecialist interpreters. The pseudo-outcrop visualization is equivalent to a nonlinear projection of the image from borehole to earth frame of reference that creates a solid volume sliced longitudinally to reveal two or more faces in which the orientations of geological features indicate what is observed in the subsurface. A proxy for grain size is used to modulate the external dimensions of the plot to mimic profiles seen in real outcrops. The volume is created from a mixture of geological boundary elements and texture, the latter being the residue after the sum of boundary elements is subtracted from the original data. In the case of measurements from wireline microresistivity tools, whose circumferential coverage is substantially $<100\%$, the missing circumferential data are first inpainted using multiscale directional transforms, which decompose the image into its elemental building structures, before reconstructing the full image. The pseudo-outcrop view enables direct observation of the angular relationships between features and aids visual comparison between borehole and core images, especially for the interested nonspecialist.

MSC:

[86A60](#) Geological problems

[86-08](#) Computational methods for problems pertaining to geophysics

Keywords:

[wellbore](#); [microresistivity](#); [image](#); [inpainting](#)

Software:

[Steerable pyramid](#)

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