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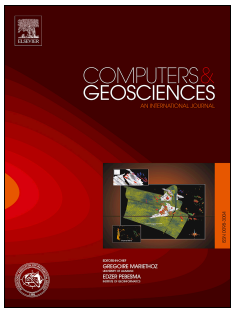

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Phase Composition Maps Integrate Mineral Compositions with Rock Textures from the Micro-meter to the Thin Section Scale

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Abstract

Textures and compositions are critical information for interpreting rock formation. Existing methods to integrate both types of information favor high-resolution images of mineral compositions over small areas or low-resolution images of larger areas for phase identification. The method in this paper produces images of individual phases in which textural and compositional details are resolved over three orders of magnitude, from tens of micrometers to tens of millimeters. To construct these images, called Phase Composition Maps (PCMs), we make use of the resolution in backscattered electron (BSE) images and calibrate the gray scale values with mineral analyses by energy-dispersive X-ray spectrometry (EDS). The resulting images show the area of a standard thin section (roughly 40 mm x 20 mm) with spatial resolution as good as 3.5 μm/pixel, or more than 81 000 pixels/mm^2, comparable to the resolution of X-

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