



Nondestructive microscale texture observation of exsolved magnetite in silicate using laser confocal microscopy

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Exsolved magnetite in silicate minerals such as plagioclase and pyroxenes show high magnetic stability and remanence acquisition efficiency. They are expected to be important remanence carriers for paleomagnetism as well as crustal magnetic anomalies. At the same time, they often exhibit strong magnetic anisotropy, which makes paleomagnetic experiments and interpretations difficult. Magnetic anisotropy should be a direct consequence of strong preferred orientation of exsolved magnetite. Thus, it is helpful to quantify the texture of exsolved magnetite. Previous texture observations employed surface observation such as electron backscatter diffraction or destructive technique such as focused ion beam milling, and comparison with magnetic measurements was difficult. Nondestructive optical observation using universal stage has been reported, but such technique is time consuming and of limited spatial resolution. In this presentation, I report the application of laser confocal microscopy to measure quasi three-dimensional texture of plagioclase hosted exsolved magnetite at submicron scale. This is essentially a reflection microscopy, and the thickness of the opaque magnetite cannot be precisely measured. Nonetheless, it offers nondestructive, relatively easy way to observe large volume of samples. I will also present comparison between texture and magnetic properties.