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岩石磁组构可以揭示应变吗?——以华南地块早三叠世灰岩为例

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摘要 一般认为磁组构能有效地反映岩石所经历的应变特征. 为了研究不同类型的磁组构和不同期次应变之间的关系, 对来自华南地块两个地区的早三叠世灰岩样品进行了岩石磁学、磁组构以及应变特征的对比分析. 来自湖北通山县的样品经历了三期构造变形, 这为解析磁组构和多期次应变提供了理想的机会. 岩石磁学结果显示携磁矿物主要为磁铁矿. 磁化率各向异性 (AMS) 和非磁滞剩磁各向异性 (AAR) 结果显示其最小轴与层面垂直, 最大轴和中间轴分布于层面内, 反映了沉积和压实作用产生的应变, 而后期构造应变在磁组构中没有体现. 来自广东连县的样品发育有渗透性压溶缝面理和方解石脉, 说明经历了构造应变. AMS 结果没有显示占优势的组构方向. AAR 结果显示三轴组构, 其最大轴分布于最大应力方位, 与构造应变特征吻合, 最初的压实组构被构造应变组构所代替. 上述结果表明: (1) AAR 可以很好地反映渗透性应变的特征, 而 AMS 有时会失效; (2) 应变的尺度要小于样品的尺度, 磁组构才能有效地反映应变.

关键词 [灰岩](#) [磁组构](#) [应变](#) [岩石磁学](#)

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Can rock magnetic fabric reveal strain? Case studies of Early Triassic limestones from South China Block

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Abstract It is generally regarded that magnetic fabrics can effectively reveal strain in rocks. In order to investigate the relationship between different magnetic fabric types and different stages of strain, we conducted a combined analysis of rock magnetism, magnetic fabrics and mesoscopic deformation features for Early Triassic limestones from two areas in the South China Block. Samples from the Tongshan county, Hubei province underwent three stages of deformation, which provided an ideal opportunity to test the relationship between magnetic fabric and multiple deformations. The minimum axes of AMS and AAR ellipsoids are normal to the bedding and the intermediate and maximum axes lie within the bedding, indicating deposition and compaction fabrics having not been affected by tectonic strain. Samples from the Lian county, Guangdong province experienced tectonic strain as evidenced by pervasive pressure solution seams and calcite veins. The principal directions of AMS are scattered, but those of AAR are well clustered, showing a triaxial fabric. The maximum axes of AAR are distributed around the maximum stress direction indicated by the geometry of calcite veins. The initial compaction fabric was replaced by tectonic strain. These results suggest: (1) AAR can better reflect pervasive strain than AMS; (2) Only under the condition that the scope of strain is less than that of the sample can magnetic fabric effectively reveal strain.

Key words [Limestones](#); [Magnetic fabrics](#); [Strain](#); [Rock magnetism](#)

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