**Abstract**

The effects of dyke intrusion on the magnetic properties of host sedimentary rocks are still poorly understood. Therefore, we have evaluated bulk magnetic parameters of standard palaeomagnetic samples collected along several sections across the sediments hosting the Foum Zguid dyke in southern Morocco. The study has been completed with the evaluation of the magnetic fabric after laboratory application of sequential heating experiments.

The present study shows that: (1) close to Foum Zguid dykes, the variations of the bulk magnetic parameters and of the magnetic fabric is strongly related with re-crystallization and Fe-metasomatism intensity. (2) The thermal experiments on AMS of samples collected farther from the dyke and, thus, less affected by heating during dyke emplacement, indicate that 300–400 °C is the minimum experimental temperature necessary to trigger appreciable transformations of the pre-existing magnetic fabrics. For temperatures higher than ca. 580 °C, the magnetic fabric transformations are fully realized, with complete transposition of the initial fabric to a fabric similar to that of samples collected close to the dyke. Therefore, measured variations of the magnetic fabric can be used to evaluate re-crystallization temperatures experienced by the host sedimentary rock during dyke emplacement. The distinct magnetic behaviour observed along the cross-sections strongly suggests that samples collected farther from the dyke margins did not experience thermal episodes with temperatures higher than 300 °C after dyke emplacement. (3) AMS data shows a gradual variation of the magnetic fabric with distance from the dyke margin, from sub-horizontal *K*3 away from the dyke to vertical *K*3 close to the dyke. Experimental heating shows that heat alone can be responsible for this strong variation. Therefore, such orientation changes should not be unequivocally interpreted as the result of a stress field (resulting from the emplacement of the dyke, for instance). (4) Magnetic studies prove to be a very sensitive tool to assess rock magnetic transformations, thermally and chemically induced by dyke intrusion in hosting sediments.

**Article Outline**

1. [Introduction](http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V61-4HSY51C-1&_user=2459685&_coverDate=01%2F31%2F2006&_alid=1590632689&_rdoc=12&_orig=search&_origin=search&_zone=rslt_list_item&_cdi=5801&_sort=r&_st=4&_docanchor=&_ct=12&_acct=C000057392&_version=1&_urlVersion=0&_userid=2459685&searchtype=a&_fmt=full&_pii=S0012821X05006862&_issn=0012821X&md5=2f51ba7b865761da27af6accd496691d#secx1)

2. [Geological setting and sampling](http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V61-4HSY51C-1&_user=2459685&_coverDate=01%2F31%2F2006&_alid=1590632689&_rdoc=12&_orig=search&_origin=search&_zone=rslt_list_item&_cdi=5801&_sort=r&_st=4&_docanchor=&_ct=12&_acct=C000057392&_version=1&_urlVersion=0&_userid=2459685&searchtype=a&_fmt=full&_pii=S0012821X05006862&_issn=0012821X&md5=2f51ba7b865761da27af6accd496691d#secx2)

3. [Petrography](http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V61-4HSY51C-1&_user=2459685&_coverDate=01%2F31%2F2006&_alid=1590632689&_rdoc=12&_orig=search&_origin=search&_zone=rslt_list_item&_cdi=5801&_sort=r&_st=4&_docanchor=&_ct=12&_acct=C000057392&_version=1&_urlVersion=0&_userid=2459685&searchtype=a&_fmt=full&_pii=S0012821X05006862&_issn=0012821X&md5=2f51ba7b865761da27af6accd496691d#secx3)

4. [Rock magnetism](http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V61-4HSY51C-1&_user=2459685&_coverDate=01%2F31%2F2006&_alid=1590632689&_rdoc=12&_orig=search&_origin=search&_zone=rslt_list_item&_cdi=5801&_sort=r&_st=4&_docanchor=&_ct=12&_acct=C000057392&_version=1&_urlVersion=0&_userid=2459685&searchtype=a&_fmt=full&_pii=S0012821X05006862&_issn=0012821X&md5=2f51ba7b865761da27af6accd496691d#secx4)

5. [Magnetic properties according to distance from dyke margin](http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V61-4HSY51C-1&_user=2459685&_coverDate=01%2F31%2F2006&_alid=1590632689&_rdoc=12&_orig=search&_origin=search&_zone=rslt_list_item&_cdi=5801&_sort=r&_st=4&_docanchor=&_ct=12&_acct=C000057392&_version=1&_urlVersion=0&_userid=2459685&searchtype=a&_fmt=full&_pii=S0012821X05006862&_issn=0012821X&md5=2f51ba7b865761da27af6accd496691d#secx5)

5.1. [Bulk magnetic parameters](http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V61-4HSY51C-1&_user=2459685&_coverDate=01%2F31%2F2006&_alid=1590632689&_rdoc=12&_orig=search&_origin=search&_zone=rslt_list_item&_cdi=5801&_sort=r&_st=4&_docanchor=&_ct=12&_acct=C000057392&_version=1&_urlVersion=0&_userid=2459685&searchtype=a&_fmt=full&_pii=S0012821X05006862&_issn=0012821X&md5=2f51ba7b865761da27af6accd496691d#secx6)

5.2. [Magnetic fabric](http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V61-4HSY51C-1&_user=2459685&_coverDate=01%2F31%2F2006&_alid=1590632689&_rdoc=12&_orig=search&_origin=search&_zone=rslt_list_item&_cdi=5801&_sort=r&_st=4&_docanchor=&_ct=12&_acct=C000057392&_version=1&_urlVersion=0&_userid=2459685&searchtype=a&_fmt=full&_pii=S0012821X05006862&_issn=0012821X&md5=2f51ba7b865761da27af6accd496691d#secx7)

6. [Characterization of the magnetic properties by laboratory heating experiments](http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V61-4HSY51C-1&_user=2459685&_coverDate=01%2F31%2F2006&_alid=1590632689&_rdoc=12&_orig=search&_origin=search&_zone=rslt_list_item&_cdi=5801&_sort=r&_st=4&_docanchor=&_ct=12&_acct=C000057392&_version=1&_urlVersion=0&_userid=2459685&searchtype=a&_fmt=full&_pii=S0012821X05006862&_issn=0012821X&md5=2f51ba7b865761da27af6accd496691d#secx8)

6.1. [Bulk magnetic parameters](http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V61-4HSY51C-1&_user=2459685&_coverDate=01%2F31%2F2006&_alid=1590632689&_rdoc=12&_orig=search&_origin=search&_zone=rslt_list_item&_cdi=5801&_sort=r&_st=4&_docanchor=&_ct=12&_acct=C000057392&_version=1&_urlVersion=0&_userid=2459685&searchtype=a&_fmt=full&_pii=S0012821X05006862&_issn=0012821X&md5=2f51ba7b865761da27af6accd496691d#secx9)

6.2. [Magnetic fabric](http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V61-4HSY51C-1&_user=2459685&_coverDate=01%2F31%2F2006&_alid=1590632689&_rdoc=12&_orig=search&_origin=search&_zone=rslt_list_item&_cdi=5801&_sort=r&_st=4&_docanchor=&_ct=12&_acct=C000057392&_version=1&_urlVersion=0&_userid=2459685&searchtype=a&_fmt=full&_pii=S0012821X05006862&_issn=0012821X&md5=2f51ba7b865761da27af6accd496691d#secx10)

6.3. [Difference tensor](http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V61-4HSY51C-1&_user=2459685&_coverDate=01%2F31%2F2006&_alid=1590632689&_rdoc=12&_orig=search&_origin=search&_zone=rslt_list_item&_cdi=5801&_sort=r&_st=4&_docanchor=&_ct=12&_acct=C000057392&_version=1&_urlVersion=0&_userid=2459685&searchtype=a&_fmt=full&_pii=S0012821X05006862&_issn=0012821X&md5=2f51ba7b865761da27af6accd496691d#secx11)

7. [Discussion](http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V61-4HSY51C-1&_user=2459685&_coverDate=01%2F31%2F2006&_alid=1590632689&_rdoc=12&_orig=search&_origin=search&_zone=rslt_list_item&_cdi=5801&_sort=r&_st=4&_docanchor=&_ct=12&_acct=C000057392&_version=1&_urlVersion=0&_userid=2459685&searchtype=a&_fmt=full&_pii=S0012821X05006862&_issn=0012821X&md5=2f51ba7b865761da27af6accd496691d#secx12)

8. [Conclusions](http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V61-4HSY51C-1&_user=2459685&_coverDate=01%2F31%2F2006&_alid=1590632689&_rdoc=12&_orig=search&_origin=search&_zone=rslt_list_item&_cdi=5801&_sort=r&_st=4&_docanchor=&_ct=12&_acct=C000057392&_version=1&_urlVersion=0&_userid=2459685&searchtype=a&_fmt=full&_pii=S0012821X05006862&_issn=0012821X&md5=2f51ba7b865761da27af6accd496691d#secx13)

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