such survey has been recently performed over the Muglad Basin of Southern Sudan, flown with a relatively small line spacing (500 m) and low ground clearance (100 m) — a typical of "normal" hydrocarbon aeromagnetic survey specification. The analysis of these data shows how a high-resolution survey can be a valuable means of: (i) delineating exploration fairways, but more importantly, (ii) prioritising seismic structural leads and (iii) targeting unforeseen non-structural hydrocarbon traps.

Numerous researchers including: Jenny, Pirson, Donovan, Roberts, Foote, Machel, Land, Saunders, Schumacher and LeSchack, have studied this phenomenon over the past 70 years confirming its validity, and indeed many of whom recommending its use as a standard exploration method (See separate file for a fuller bibliography of relevant papers). Yet despite this, and acknowledging the similar documented achievement of the closely related surface geo/biochemistry approach (Wagner *et al.*, 2002), the oil industry is yet to fully embrace it as a standard exploration tool. The micromagnetic exploration approach is likely to remain empirical for some time to come due to the complex interplay of the geological, geochemical and biochemical factors involved. It is this empiricism that appears to deter some oil companies. The validation for this exploration approach, provided by the accompanying southern Sudan case history, contributes to the growing body of evidence that this is a valuable exploration tool that ought to be used with greater confidence in the field.

The micromagnetic exploration approach is empirical, and in common with *all* oil exploration methods, cannot always be expected to provide definitive answers. The approach nonetheless provides a valuable means of mapping closely coupled microseep responses when ground conditions are favourable. It is probably most successful when applied over land areas that have a sustained or annually recharged water table (like the Sudd region of Southern Sudan), and, *shallow* lakes and seas. Arid regions with intact *palaeo* shallow basal water table deposits may also be amenable to this approach.

Sophisticated data microlevelling plays a critical role in the proper conditioning of high resolution magnetic data for micromagnetic aureole recognition.

We believe that as smaller oil fields become more economic to exploit, the high resolution aeromagnetic technique should become especially useful insofar as the physical size of a leaky reservoir is not the main factor in determining the size, amplitude or area, of aureole response. Factors such as: timing of charge, overpressure, seep duration and seep rate are probably more significant.