



Relationship between environmental conditions and magnetic properties of Norwegian Upper Jurassic black shales

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As part of a project to describe Upper Jurassic black shales from the Hekkingen Formation on the Norwegian shelf, several cores were investigated, including 7430/10-U-01 north of the Nordkapp Basin (Barents Sea), and 7018/05-U-01 offshore Tromsø. The aim of this work was to correlate the different cores across the shelf using magnetostratigraphy, and thus to understand the depositional changes with time along the shelf.

The cores were first described in terms of sedimentology, where facies logging was used to investigate the changing flow processes. In addition, bulk magnetic susceptibility was measured in the cores. This was done by taking small samples at intervals of 2-10 cm (depending on the sedimentation rate and thus thickness of the targeted time interval in each core); the relatively fine sampling interval was used to allow for detection of small variations. These two results were compared to determine the links between the sedimentological characteristics and any variations or trends in the intensity variations of the bulk susceptibility readings. The different cores were also used to try and link the deposition of black shales across the Norwegian shelf.

The results show that it is possible to correlate some of the sedimentary facies to the magnetic signal in the cores, indicating a sedimentary environmental influence on the signal. The magnetic susceptibility readings are relatively weak, but there still is a great variation in the cores. The variations are often local, for example as a result of the presence of siderite, but larger scale trends with shifts in the intensity of the susceptibility are present, which can ideally be used for correlation purposes.