

## 位於日本幌延町地下研究實驗室中的矽質泥岩中的微構造 與斷層起源

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### 摘要

日本的幌延町地下研究實驗室，針對矽質泥岩中與斷層相關的微構造和斷層方向進行了研究。薄暗帶定義了一個弱的葉理，可以在薄片觀察到壓密碎屑狀構造。這些構造不但可以在斷層沿線也可以在斷層端點以外的區域發現，在露頭和岩芯中均能觀察到。大部分的帶都非常薄，以至於在薄片中也難以測量其厚度。然而，斷層表面的掃描電子顯微鏡圖像顯示出帶內存在化學壓密的證據。覆蓋在矽質泥岩之上的矽藻泥岩中，類似的暗帶中可以觀察到毫米級的位移。在所有鑽孔中，未褶皺前斷層的主要方向為西北西-東南東，且近乎垂直的傾角。這些觀察結果表明，斷層是隨著壓密剪切帶在韌性或脆性任性的情況下形成的。壓密剪切帶是在斷層之前形成的，並且均在因阿穆里亞板塊(Amurian plate)向東擠壓導致的東西向壓力所造成的褶皺之前。

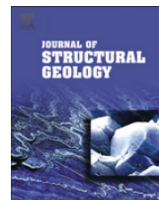
**關鍵字：**微構造、斷層、剪切帶、泥岩



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## Microstructure and origin of faults in siliceous mudstone at the Horonobe Underground Research Laboratory site, Japan

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### ABSTRACT

Fault-related microstructures and fault orientations in siliceous mudstone were studied at the Horonobe Underground Research Laboratory site in Japan. Thin dark bands define a weak foliation that exhibits compactional cataclastic fabrics in thin section. These fabrics were observed both along the faults and beyond the fault tips, in outcrop and in drill core. Most of the bands are so thin that it was not possible to measure their thickness in thin section. However, scanning electron microscope images of fault surfaces revealed evidence of chemical compaction within the bands. Millimeter-scale displacements occur along similar dark bands in diatomaceous mudstone, which overlies the siliceous mudstone. In all boreholes, the dominant orientation of unfolded faults is WNW–ESE strike and a near-vertical dip. These observations suggest that the faults formed along compactional shear bands that in turn nucleated under ductile or brittle–ductile conditions. The development of compactional shear bands preceded fault formation, occurring just prior to folding, in response to E–W compression related to the eastward migration of the Amurian plate.

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