

Spatial association between talc-rich mineralization and a "black smoker"-type deposit in a newly discovered inactive field (MARK area, Mid-Atlantic Ridge)

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Since 1977 and the discovery of the first high temperature (HT) hydrothermal vent, more than 300 sites are known. Among these hydrothermal sites, the talc-rich deposit is the most recent class of hydrothermal system discovered on the seafloor [1]. Only three talc-rich deposits have been described so far: (i) the active Von Damm Vent Field (VDVF), (ii) the inactive St Paul's and (iii) Conrad fracture zones deposits [2]. These hydrothermal sites are associated with lower crustal rocks and/or serpentinized peridotites and might be widespread at slow or ultraslow spreading ridge. However, no clear spatial or temporal relationship of this new class of hydrothermal system and the "black smoker"-like system has been highlighted.

During the HERMINE cruise [3] (March-April 2017), an inactive hydrothermal area was discovered 28km northwest of the Snake Pit vent field (25km west of the axial rift). At least two deposits have been observed during a Nautile HOV dive. One of the deposits is composed of talc-rich rocks (up to 75% talc) and has geochemical characteristics similar to that of talc-rich deposits described in the literature. The other deposit located less than 1km to the northeast is characterized by copper-rich mineralization (up to 3.3 wt.%) similar to "black-smoker"-like system. To our knowledge, this is the first time that such a spatial relationship has been described between these two classes of deposits. The preliminary result on this newly discovered inactive field will be presented here.

[1] Hodgkinson et al. (2015) *Nat. Commun* 6:10150
doi: 10.1038/ncomms10150 .

[2] D'Orazio et al. (2004) *Eur. J. Mineral.* 16, 73-83

[3] Fouquet and Pelleter (2017),
<https://doi.org/10.17600/17000200>