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CRISP コスタリカ地震発生帯における高い古地殻熱流量
High paleo-heat flow in Costa-Rica seismogenic zone, off Osa peninsula (CRISP Exp344)

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Seismogenic depth of the plate subduction large earthquake may depend on thermal condition of the plate boundary (Hyndman et al., 1990). Thermal condition is one of important data to drill the seismogenic zone. Two types of plate subduction zones of the accretion and erosive are developed in the world, and the Costa-Rica subduction zone is one of the typical erosive margin. The Cocos ridge originated from the Galapagos hotspot subducts in the southern part of the Costa-Rica and uplifts the seismogenic zone to drillable depth for CHIKYU riser drilling system. The IODP Exp.344 drilled and took the core samples at the upper plate wedge of the Costa-Rica margin (Harris et al., 2013). The site U1380 and U1413 penetrated upper pate rock above the seismogenic zone. We estimated paleo-heat flow in these sites using the technique of the vitrinite reflectance.

In the results, 11 and 13 samples of the vitrinite reflectance are obtained at site U1380 (500-800 mbsf) and U1413 (0-600 mbsf) respectively. The value of the vitrinite reflectance increases with depth from 0.15 to 0.60 %. The average increase rate of 0.51 %/km at site U1380 and 0.53 %/km at site U1413 correspond to the heat flow of 115-123 mW/m2. This heat flow is two times higher than the present heat flow of 44.2-56.2 mW/m2 obtained from borehole temperature measurement (Harris et al., 2013). Pore-fluid chemistry found fluid seepage from deep level within middle slope sediment (Harris et al., 2013). Such fluid flow from deep portion can transfer heat and possibly have caused high thermal-event.

キーワード: IODP, 地震発生帯掘削, コスタリカ, 地殻熱流量, ビトリナイト反射率
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