

AXIAL MAGNETIC ANOMALY OVER STARVED SPREADING CENTER OF THE ST. PAUL'S FRACTURE ZONE (EQUATORIAL ATLANTIC): DELAYED MAGNETIZATION RECORDED BY SERPENTINITES

SICHLER, B., HEKINIAN, R., IFREMER, PLOUZANE, FRANCE

The St. Paul F.Z. is a multiple transform fault interrupted by several Intra-Transform-Ridges (ITR) spreading centers. During the St. Paul cruise, a detailed magnetic survey corrected from the diurnal variations using a moored magnetic station, 6 submersible dives and 3 bottom towed camera profiles provided complementary data on the eastern ITR (N 0°37', W 25°27'). Visual observations and submersible sampling displayed a high ultramafic/volcanic ratio which strengthens the assumption of a starved state of the ITR : basalts were only found in the rift valley at 4700-4000m and on the top of the rift walls (2700m) as a thin cap (160m). The rest of the rift walls consists essentially of serpentinized peridotites. The processing of the magnetic data shows a well defined central anomaly. A generalized inversion method was applied, assuming that the bottom topography is fitted by elementary cells of 1x1x0.5 Km³. The computed distribution of magnetizations spreads from -12.5 A/m to +12.9 A/m. The width of the central normal polarity (Brunhes epoch) provides a high spreading rate of at least 47.7 mm/y, even though the fastest cinematic model gives 31.77mm/y. This 50% excess is believed to be meaningful : It would be the effect of the thermochemical magnetization of peridotites during the serpentinization, then the magnetization of the sea floor would not directly be linked with its emplacement as in a pure thermo-remanent Vine-Matthews anomaly. In a starved ridge, the magnetization of the peridotites could continue as tectonics allow their hydration, therefore the magnetic time recorded by the oceanic floor is blurred.