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# Cold spots along mid-ocean ridges revealed by anomalously low subsidence rates

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Linear subsidence of the seafloor bathymetry versus the square root of its age after being formed at the mid-ocean ridge is one of the fundamental predictions of the classical seafloor cooling model. According to the successful predictions, the subsidence rate will be controlled by the upper mantle temperature, the heat diffusivity and the thermal expansion coefficient at the mid-ocean ridge. Assuming that the upper mantle temperature dominates influences from the rest two physical parameters, it is likely that variation of subsidence rate along the mid-ocean ridges will reveal the along strike temperature variation and the associated mantle dynamics. We take advantage of the global bathymetry, isopach and isochron data and systematically inspect the along strike pattern of the subsidence rate variation. Four most pronounced cold spots thus revealed include segments south of the Romanche fracture zone in Mid-Atlantic Ridge, South East Pacific Rise, Antarctic-Australia Discordance situated on the Mid-Indian Ridge and Southwest Indian Ridge, east of 70E. Except for AAD that might be related to historical subducted cold material in the mantle, all of them seem to be related to cooling induced by pronounced fracture zones.

References

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