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Sedimentology and sequence stratigraphy of the southern tethyan margin : comparison of the Iran and Oman parts

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The goal of this project is a sedimentological and sequence stratigraphy study of the Iranian part of the southern Tethys margin, lateral equivalent of the Omani outcrops, in order to better constrain the effects of the tectonic, climate and global seawater chemistry changes on the geometry of this margin from the Late Permian(?) to the Upper Cretaceous. We have focused on severals parts of the Iranian southern margin of the Tethys. The palaeo-margin have been inverted during the Late Cretaceous to Early Tertiary time. The basin plain deposits corresponds to the Kermanshah unit in north-west or Pichakun units in south-east, the platform/upper ramp ones to the autochtonous of Borudjerd area in north or Kuh e Kat outcrops near Neyriz, and some isolated platforms ones to the Bisitoun units all along the margin. The basin plain deposits are mainly composed of radiolarites and thin calcareous turbiditic deposits, more proximal carbonate turbiditic systems occurred during the Upper Triassic, Liassic-Dogger (?) and part or the Lower Cretaceous. The general trend through the Mesozoic seems to be an overall deepening with an increase around the Jurassic/Cretaceous transition. A similar study has been carried out on the Tethyan paleomargin of Oman since 6 years and is now ended. In term of dataset, the main difference is the highest number of outcropping tectonic units that allow a much better reconstruction of the paleomargin than in Iran. In Oman, all the sedimentary environments from the oceanic seamounts to the slope have been partly preserved. This can be explained by the tectonic evolution of Oman where no collision occurred after the Maastrichtian obduction. The second difference is the age of sedimentary record that starts in the Middle

Permian in Oman. In term of paleotopography, both the Oman and Iran margin sediments were deposited on a deep-sea plain by various types of gravitary deposits, from debris flows to low-density turbidity currents. For the Middle Jurassic (Guwayza Fm in Oman), the Oman's margin is characterized by gravitary systems with a high efficiency of transport (importance of the by-pass facies, spreading of the ooids at least 300 km off the toe of the slope/ramp). By contrast, the Iran's margin seems to be characterized by gravitary systems with a low efficiency of transport (stack of conglomeratic facies, upstream parts of lobes with few by-pass deposits). This suggests a more narrow deep-sea plain than in Oman. This could be confirmed by the preservation of the full deep-sea plain depositional profile in the same tectonic unit? In term of geodynamic evolution, the main differences are (1) the absence of the Late Jurassic (Late Kimmeridgian-Early Tithonian) deformation and truncation characteristics of the Oman paleomargin both on the shelf and on the deep-sae plain, (2) the occurrence of a major downward shift of facies during Aptian-Albian in Iran with resedimentation of the platform. The absence of Late Jurassic deformation in Iran can be explained by its origin, an intraplate deformation in response to the Indian Ocean sea-floor spreading. The Aptian-Albian downward shift in Iran can be record of the plate kinematics reorganization between Africa/Arabia and Eurasia (Austrian phase). More 10 my duration cycles have been recorded during the Early Cretaceous in Iran than in Oman. This can be explained by one of the consequence of the Late Cretaceous deformation: a 250 km retreat of the platform and its result, a progradation until the Cenomanian. The unconformity recorded in the Oman deep-sea record (Sidr1-Sidr 2 Members boundaries, intra-Valanginian) is the time of accommodation space removal during the platform progradation in response to the glacioeustatic Valanginian event. In Iran, this Late Jurassic platform retreat did not occur. This can explain the record of the all tectono-eustatic event affecting the platform margin.Then the topography of the Margin and the subsidence of the deep-sea plain seem different.