Reflection seismic expression of Cretaceous Platform - Basin facies transition in the Adriatic -

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Jurassic and Cretaceous in Italy are characterized by two different types of sediments:

- Limestone and dolomitic limestone, pseudo-olithic, oolithic crystalline at times dolomitized, thick bedded. The environment of sedimentation is that of an open shallow water platform.
- Fine grained limestone, marly, cherty, intercalated with marl and marly shale with abundant planctonic fossils and very scarse benthos. This formation was sedimented in marine basins located between the platforms and characterized by a limited depth of water and restricted circulation.

The platform facies coincides with areas of strong subsidence. Thickness of Middle Upper Jurassic and Cretaceous sediments is often in the order of several thousand meters (probably more than 5000 in the Apulian platform). The time equivalent basinal sediments are less than 500 meters thick.

The cpmplicated tectonics of Italy do not allow for a sufficiently accurate reconstruction of the structural trends of these formations. In the Adriatic, which is a stable area unaffected by horizontal movements, the trend is NNW-SSE. In the Italian peninsula and Tyrrhenian Sea the platform basin axis was probably parallel to the Adriatic trends. These typical facies were most probably exented from the Ionian Sea across Sicily and Southern Italy, as far north as the coasts of Sardinia and Corsica which islands at the time were adjacent to the Southern coast of France.

The transition area from the basins to the platform is a zone of interfingering of the two facies and clastics, such as calcarenite, derived from the erosion of the platform are frequent. The development of reef structures, mostly patch reef, occurs along the margin of the platform. The seismic expression of this geological environment is typical.

Seismic response is poor to very poor in the platform area due to insignificant stratification and uniformity of lithotype. It is usually good in the basinal facies for opposite reasons. In the transition zone one can observe very remarkable convergencies of the upper carbonaceous beds against the platform. Convergencies refer to pinchout of the Lower Miocene-Upper Cretaceous sediments against the platform. Drilling has proved that the platform was deeply eroded locally, down to the base of the Lower Cretaceous beds, following uplift which occured after Eocene or Oligocene times. It is therefore possible to conclude that the faults which caused the subsidence of the platforms during Jurassic and Cretaceous times reversed their vertical throw and uplifted the platforms above, or near sea level. This fact must be born in mind when correlating seismic horizons across the areas. One seismic reflection line in the Central Adriatic near the 44th parallel is a typical example of a puzzle for geologists and geophysicists. It shows how it is possible to correlate the deepest horizons in two or more different ways- providing one does not take into account the geological data obtained by drilling in the area.