

## CRUSTAL STRUCTURES IN THE IONIAN SEA

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The nature of the crust in the Ionian Sea is discussed and clarified by means of offshore/onshore deep seismic profiles recorded by ocean bottom seismographs (OBS) and land stations.

The crustal studies of the Ionian started in 1969 with Meteor cruises, continued in 1979 with a joint research by IFP Paris - IMGA Trieste (Fig. 1, DSS/79) and in 1980 with two profiles (PROF. 1 and PROF. 2) recorded by IfG Hamburg and IMGA Trieste.

Six OBS of the IfG Hamburg have been deployed along PROF.1 and PROF.2, and land stations were located along the southern Sicilian coasts to record the shots on sea.

The seismic energy was generated by firing chemical explosives - 245 shots have been fired with charges ranging from 25 to 300 kg. It propagated with satisfying effectiveness (very good along PROF.1, less good in severely tectonized area along PROF.2) and energy penetrating into the upper mantle could be observed.

A further improvement of the signal to noise ratio has been obtained through data digitization and subsequent data processing with reverberation removal by application of a spike deconvolution and band-pass filtering in the time domain.

Along the profiles a combined interpretation of OBS data and multichannel seismic surveys (mainly 12 fold data) was performed to define the thickness and velocity of the sediments and the tectonic attitude of the area and to clarify the nature of the crust.

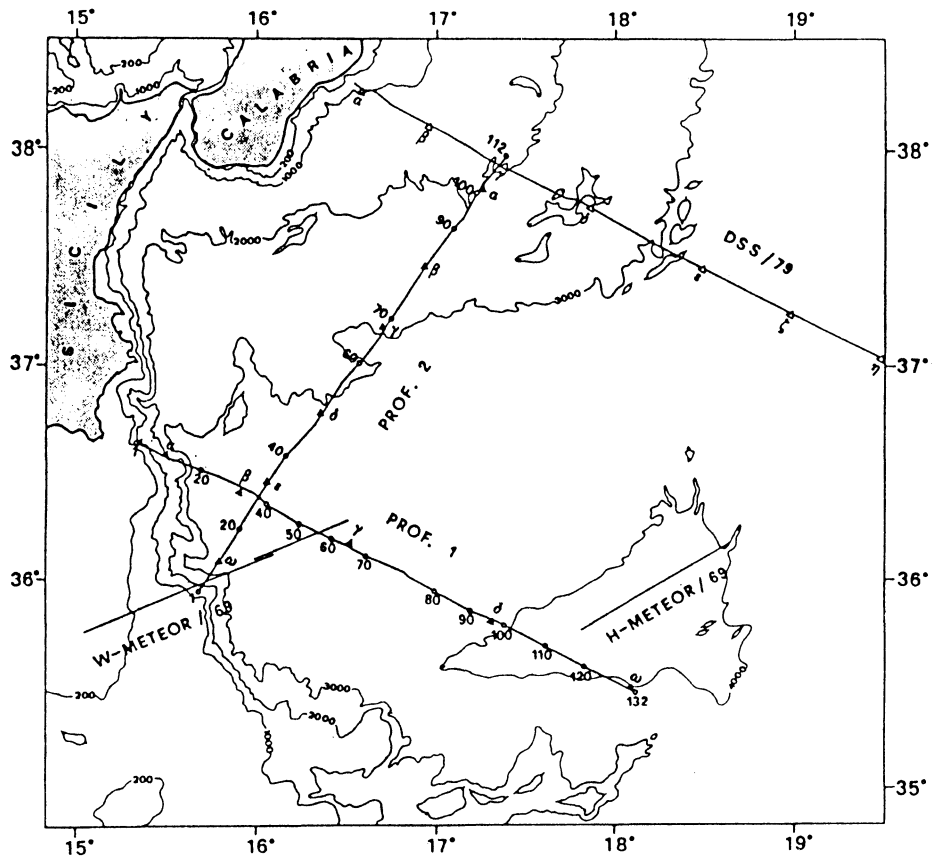


Fig. 1 - position of deep seismic soundings in the Ionian Sea.

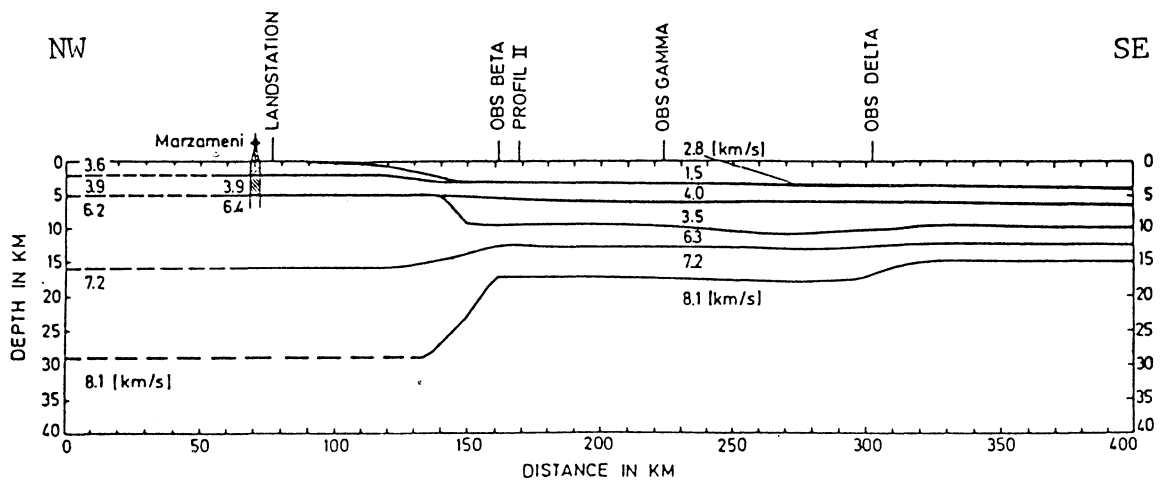


Fig. 2 - crustal section along PROF. 1.

PROF.1 allowed us to study the evolution of a passive margin (Malta escarpment) and its relations with the Ionian basin.

A minimum Moho depth (approximately 15 km) was detected in the Ionian Abyssal Plain where the thickness of the sediments is nearly 7 km, while the crystalline crust (oceanic crust?) is only 5 km thick. Elsewhere in the Ionian (PROF.-1, PROF.-2 and DSS/79) the Moho depth seems to be close to 20 km with more than 9 km of crystalline rocks.

Towards the Malta escarpment a sudden increase of the Moho depth ( $\sim 30$  km) was detected (Fig. 2).

The relation between the Calabrian active margin and the Ionian basin is evidenced by a lowering of the Moho to a depth of more than 35 km occurring in the Spartivento basin region, that is in few tens of km from the Calabria shoreline. However the tectonic features and the interacting patterns have not yet been completely defined.

With regard to the shallower sediments in the area corresponding to the External Calabrian Arc and to its extensions, a huge amount of loose sediments and of thrust blocks is piled up, but the structures of the lower crust seems to be unaffected by the colliding tectonic.

#### References

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