

## Volume flux measurements in the Bosphorus using an acoustic doppler current profiler

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The exchange of waters between the Black and the Mediterranean Seas takes place through the Strait of Bosphorus. The inflow to the Black Sea through the lower layer has been found to occur essentially on a continuous basis through the year (LATIF *et al.*, 1991), and based on long-term salinity data the volume fluxes have been determined as  $612 \text{ km}^3/\text{yr}$  for the upper layer and  $310 \text{ km}^3/\text{yr}$  for the lower layer (UNLUATA *et al.*, 1990). Direct measurements of the flows in the two layers have been carried out utilising an acoustic doppler current profiler (ADCP). The series of measurements, which commenced in April 1991, have indicated that the volume flux in each layer varies in a wide range, both seasonally and in response to the prevailing meteorological conditions at the time of the measurements. High values of the outflow from the Black Sea, corresponding to about  $700 \text{ km}^3/\text{yr}$ , were observed in April and August, while the maximum values of the inflow to the Black Sea, corresponding to about  $350 \text{ km}^3/\text{yr}$ , were observed in October. The lowest discharge values in either layer were between  $50\text{-}100 \text{ km}^3/\text{yr}$ . The surface flow velocities in the northern entrance of the Strait are typically about  $20\text{-}50 \text{ cm/s}$  (Fig. 1). The velocities increase towards the south, due to the shallowing of the interface. Particularly high velocities, of about  $150\text{-}200 \text{ cm/s}$ , exist in the constriction region in the southern part of the channel.

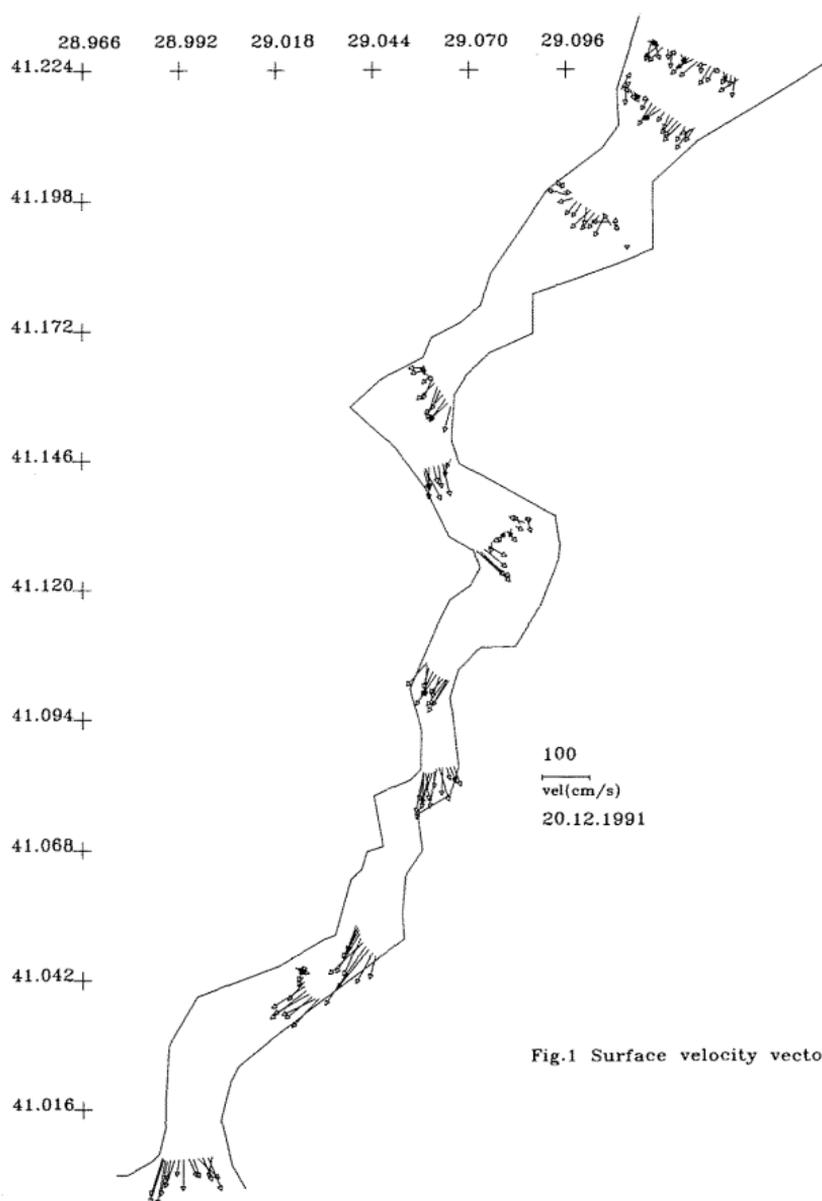


Fig.1 Surface velocity vectors

### REFERENCES

- LATIF M.A., OZSOY E., OGUZ T. and UNLUATA U., 1991.- Observations of the Mediterranean inflow into the Black Sea, *Deep Sea Research*, 38, Suppl. 2, S711-S723.  
UNLUATA U., OGUZ T., LATIF M.A. and OZSOY E., 1990.- On the physical oceanography of the Turkish Straits, in: *The Physical Oceanography of Sea Straits*, L.J.Pratt, editor, NATO ASI Series, Kluwer, Netherlands.