CIRCULATION CHARACTERISTICS OF ONE BASIN OF THE EASTERN ADRIATIC COAST

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Large number of data on currents and hydrography of the Kaštela Bay was worked out. Thus we got acquainted with the influence of different factors affecting water circulation, and annual variations of different properties of the bay.

Un grand nombre de données se référant aux courants et hydrologie de la baie de Kaštela a été utilisé afin de resoudre des problemes de l'influence des facteurs différents sur la circulation d'eau. Les variations annuelles des conditions différentes, la relation entre des circulations horizontale et verticale et "l'upwelling" ont été analisées.

The basin which has been investigated is Kaštelanski zaliv (Kaštela Bay) near Split. It has an area of 61 km^2 and average depth of 23 m. There is a small river, the Jadro, entering the bay having an average runoff of $10^3 m^3$/sec. Therefore it is basically a dilution basin, where, at least in the uppermost layer, the outflow of water prevails. This is well proved by a long time series of observations at the main mouth of the bay. At this mouth the bay is deeper than elsewhere, so the water exchange takes place in all layers. There is one other mouth, but due to its very shallow depth it is neglected.

In the surface layer of the bay both cyclonic and anticyclonic circulation were observed. The most important factor causing the sense of circulation is the wind direction.Scirocco (SE wind) causes the anticyclonic circulation. The bora (NE wind) and maestral (NW wind) causes the cyclonic circulation. An onshore

component of the circulation was observed during scirocco and an offshore component during bora. Downwelling also appears due to a deep compensatory current, during scirocco, and upwelling during bora.

The position of the basin mouth is such that it is open to the dominant NW current of the coastal sea. This current also gives an onshore component in the bay and it is connected with the anticyclonic circulation.

The average seasonal distribution of properties in the bay is such that the geostrophic equilibrium would produce cyclonic circulation with an onshore component in all layers in winter and an offshore component in all layers in summer. On the contrary, the current data give evidence that the anticyclonic circulation is more frequent in the surface layer and that the circulation is stratified with the deep current compensating the motion. This shows that the average seasonal distribution of properties affects the circulation much less than wind, water advection to the bay and freshwater runoff.

The average speed of the vertical circulation is estimated to be 1000 times lower than the horizontal one. The same relation has been observed between the horizontal and vertical dimensions of the basin. Thus, the morphology of the basin is likely to affect the relation between the vertical and horizontal circulation.

The annual variation of salinity was examined using the long time series. It is well defined by E-P factor, vertical mixing and advection. Therefore it was presumed that the local forcing and advection (representing the far field effect act with the same intensity upon the circulation. Generally examined, their influence could be well related to the net inflow and outflow of water in the surface layer calculated from

current meter data. In spring the factors influencing the circulation have low intensity and consequently current speeds are the lowest. In autumn with maximum intensitv of governing factors the current speeds are the strongest, but with rather dispersed directions. In this season vertical mixing is also developed. In winter and summer the circulation is well stratified: in winter there is an inflow of water in the surface layer with downwelling and a compensatory outgoing deep current, whilst in summer there is an outflowing current in the surface layer, developed upwelling and deep compensatory incoming current. Thus the circulation in the bay could be fully described knowing the wind and the season.

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