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Hydrodynamics of a microtidal sandy gulf : the Gulf of Aigues-Mortes (Northwestern Mediterranean sea, France)

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The protection of the microtidal sandy coast requires studying the natural and anthropic nearshore evolution and planing response to catastrophic coastal events. But, beyond these problems of coastal management, understanding the nearshore hydrodynamics which induce sedimentary transports, is essential to forecast the natural coastal morphology evolution. The hydrodynamics of the Gulf of Aigues-Mortes (GAM, Northwestern Mediterranean sea, France) governed by waves and currents induced by wind, Earth rotation (Coriolis effect) and any density gradient due to salinity or temperature heterogeneities, was never described nor modelled. It thus was impossible to predict the sedimentary transport on this area.

First, we choose to simulate on the one hand the wave-driven currents with the REFDIF model (Kirby and Dalrymple, 1984), and on the other hand the wind/buoyancy-driven currents with the Symphonie model (Estournel et al, 1997). For the characteristic situations of winds and incident waves, the results showed that nor the wave-driven currents nor the wind/buoyancy -driven currents can be neglected, because they have the same order of magnitude.

Second, in-situ measurements expected as from march 2005 will allow to check the numerical results and to force the open boundaries of the models with realistic conditions.

These results will make possible a first estimation of the contributions of the wave- and wind- driven currents on sedimentary suspension and traction transports.