- 2007GL029885, Auxiliary Material - Mediterranean sea level variations during the Messinian Salinity Crisis

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In the supplementary material show below, we present various sensitivity tests. These tests allow to evaluate the uncertainty of the simulation results. For example, an approximation of $\pm 25\%$ of the value of evaporation, precipitation and river discharge induces an uncertainty of $\pm 10\%$ on the estimation of the sea level equilibrium (Figure 1 ; file 2007GL029885-fs01.ps).

Our modelling approach allows to test the possibility of a scenerio and to reduce the space of possible. We tested the influence :

- of the uplift rate of the threshold between the Atlantic Ocean and the Mediterranean Sea (Figure 2 ; files 2007GL029885-fs02.ps, 2007GL029885-fs03.ps and 2007GL029885-fs04.ps),

- of the initial bathymetry of the threshold between the Atlantic Ocean and the Mediterranean Sea (Figure 3 ; files 2007GL029885-fs05.ps and 2007GL029885-fs06.ps),

- of the river discharge (Figure 4 ; file 2007GL029885-fs07.ps),

- of the bathymetry of the Sicily strait (Figure 5 ; 2007GL029885-fs08.ps).

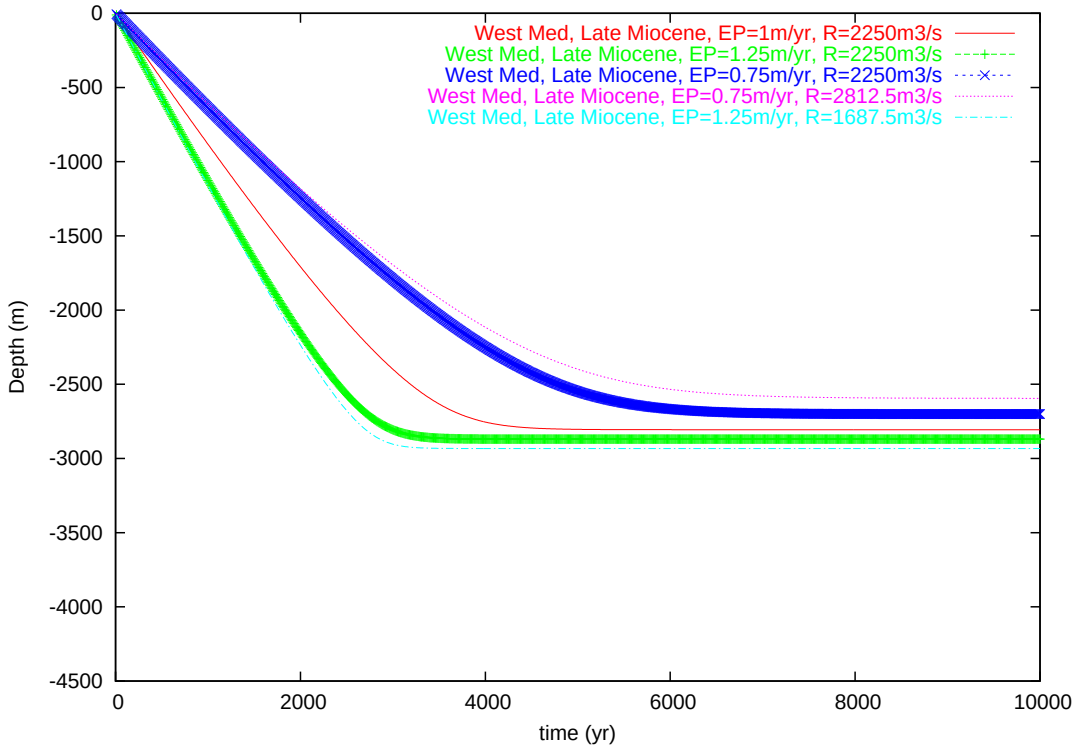

FIG. 1 – *Lowering of the Mediterranean in the Western Basin for different climatic conditions : i.e.* $\pm 25\%$ *of the value of evaporation and river discharge tested. An approximation of* $\pm 25\%$ *of the value of evaporation, precipitation and river discharge induce an uncertainty of* $\pm 10\%$ *on the estimation of the sea level equilibrium. Our rsults are in agreement with the results of Meijer and Krijgsman (2005). Small differences between the 2 models are due to the difference of geometry used to simulate the Mediterranean Basins.*

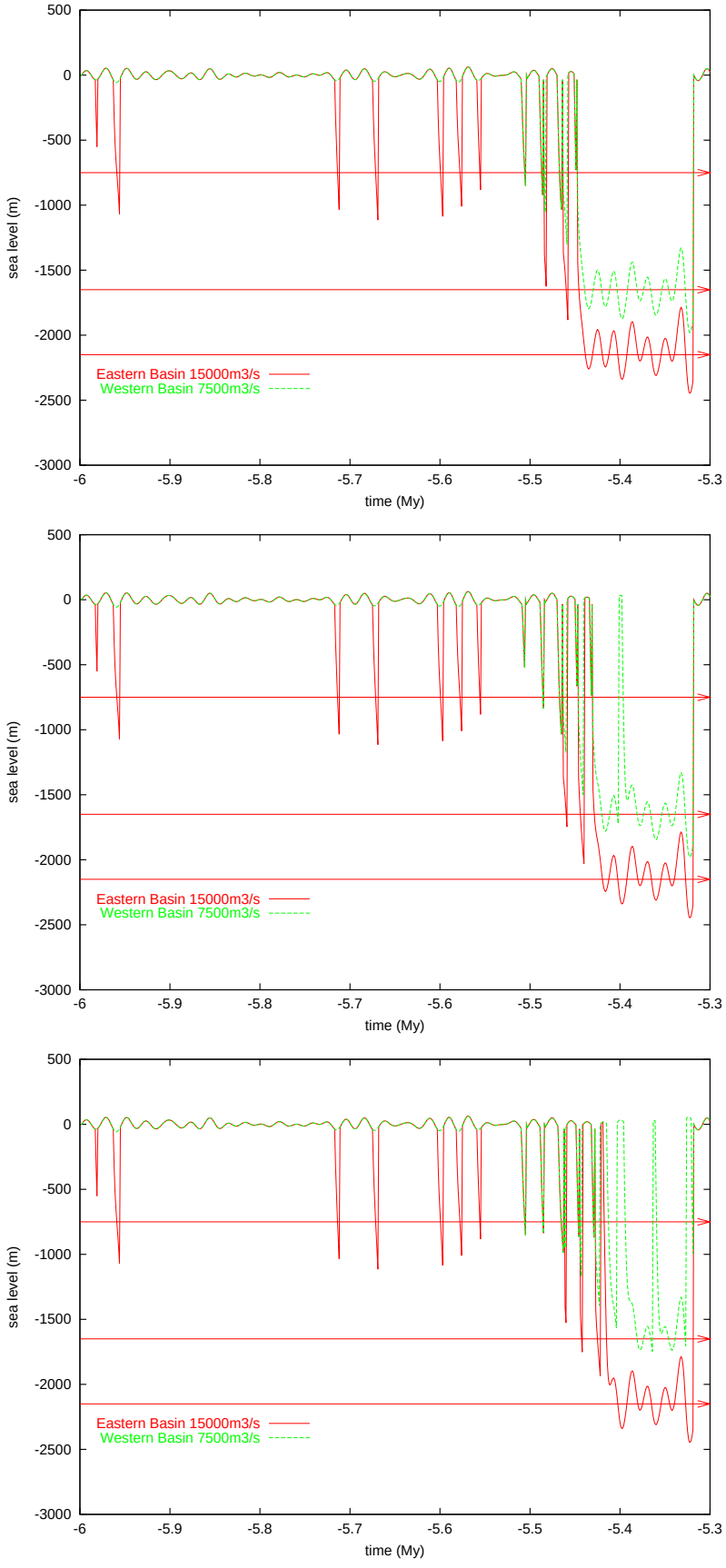

FIG. 2 – *Influence of the uplift rate of the threshold between the Atlantic Ocean and the Mediterranean Sea : (1) 0.75mm/yr, (2) 0.60mm/yr, (3) 0.40mm/yr. The less the velocity is, the more numerous are the oscillations of the Mediterranean Sea.*

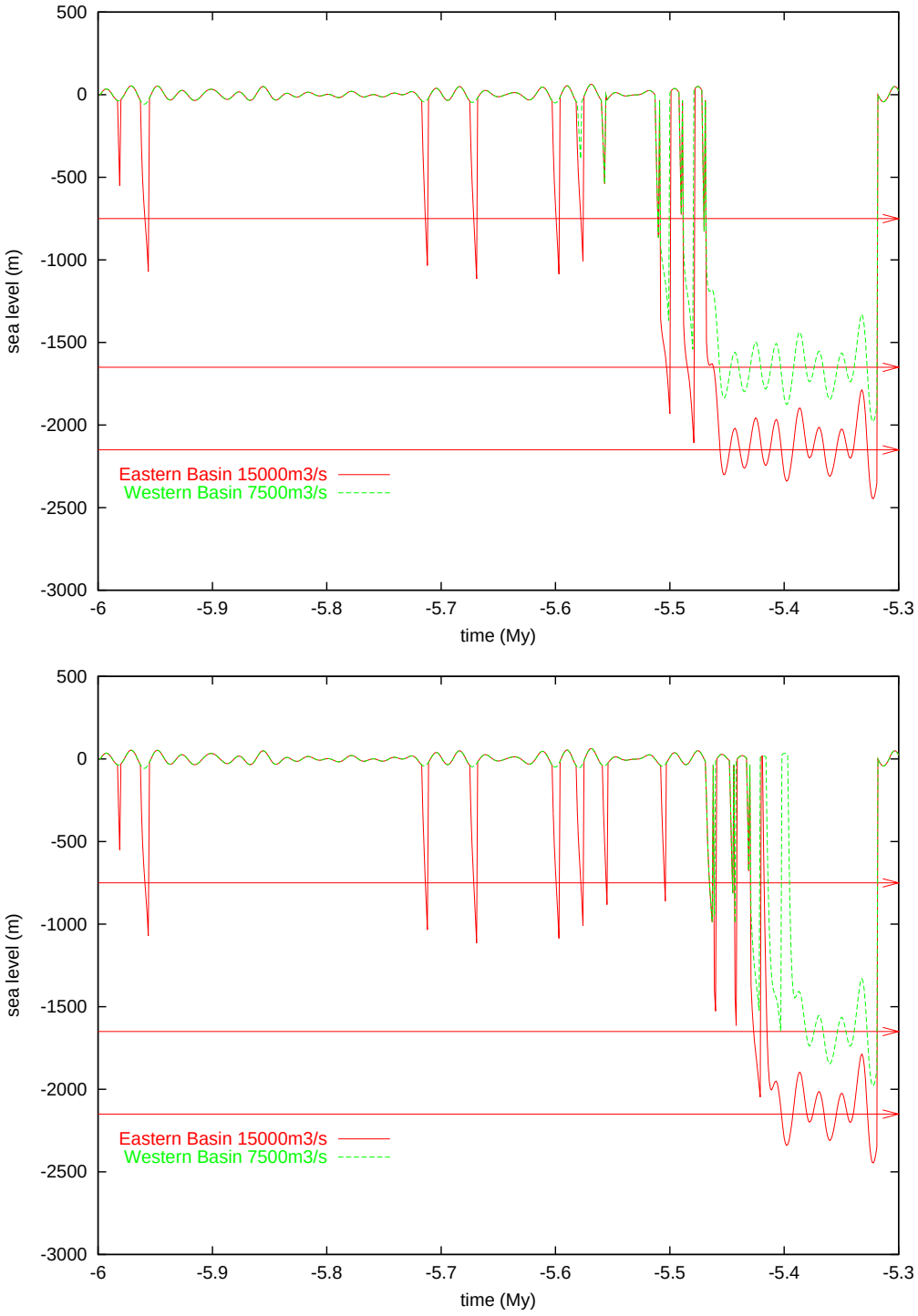

FIG. 3 – *Influence of the initial elevation (6Myr ago) of the threshold between the Atlantic Ocean and the Mediterranean Sea : (1) -330m, (2) -380m. The uplift rate is of 0.667mm/yr. The deeper the threshold is, the shorter is the isolation of the Mediterranean Sea from the Atlantic Ocean.*

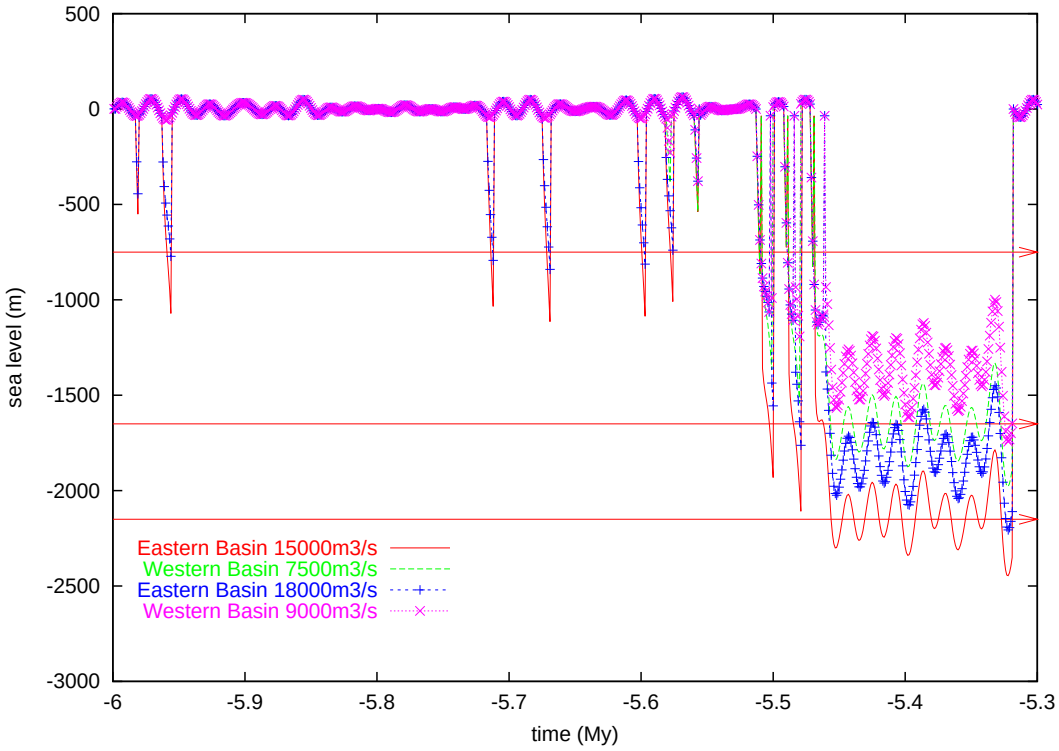

FIG. 4 – *Effect of the river discharge on the Mediterranean sea level. The more the river discharge is, the less is the Mediterranean water fall.*

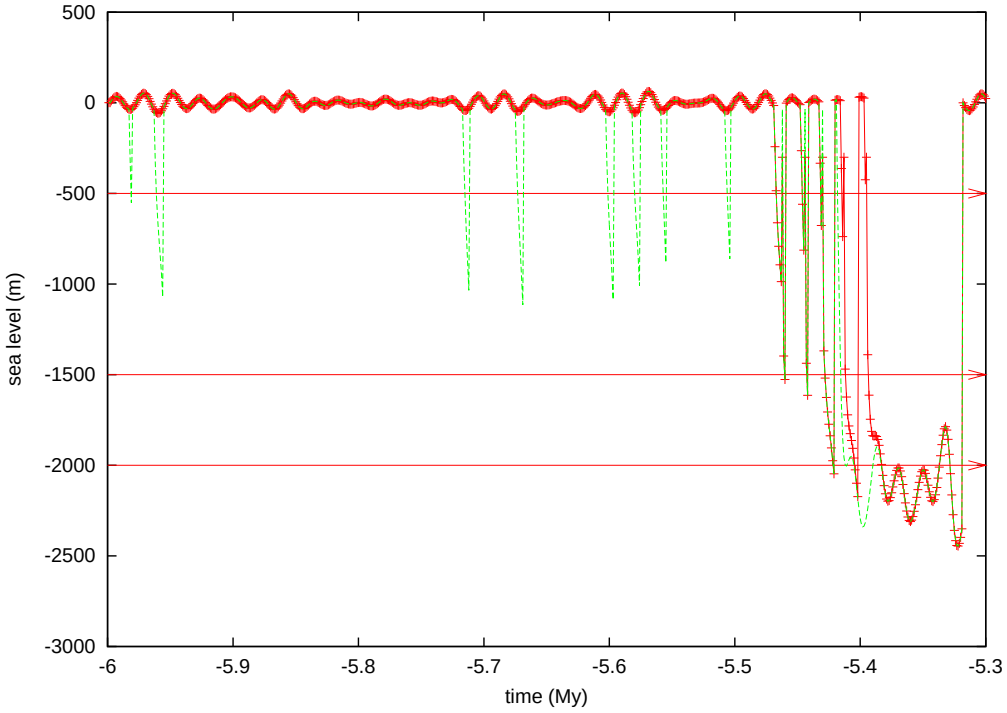

FIG. 5 – *Influence of the bathymetry of the Sicily strait on the Mediterranean water fall in the Eastern Basin during the Messinian Salinity Crisis. Red line, the bathymetry of the Sicily strait is of -300m. Green line, the bathymetry is of -35m. A shallower depth of the strait allows an earlier beginning of the Eastern Basin isolation.*