APPLICATIONS TO SYNTHETIC DATA - SENSITIVITY TO THE SEDIMENT AND SDR DENSITIES

We tested the error sensitivity in the density value of the sediment and/or SDR layer and show the results of steps 2 and 3. Parameters defining the interpretation model are shown in Table 1. We used the same parameters for inversion used in the synthetic applications of the paper.

Figure 1 and Figure 2 show the estimated model obtained at the Step 2 and Step 3 of our algorithm with true density values adopted in the applications of the paper.

Figure 3 (sediment density error) and Figure 5 (SDR density error) show the estimated model obtained at the end of Step 2 by erasing the density value of the sediment and SDR layer by $\approx 4\%$ for more and $\approx 1\%$ for less, respectively. Figure 7 shows the estimated model obtained at the end of Step 2 by erasing both density values. These models presented basement and Moho reliefs closer to the estimated surfaces in the Figure 1. In the same way, these results (Figure 3, Figure 5 and Figure 7) show predicted gravity disturbance and lithostatic stress curves with the same behavior that presented in the Figure 1.

Figure 4 (sediment density error), Figure 6 (SDR density error) and Figure 8 (sediment and SDR density error) show the estimated model obtained at the end of Step 3. We used different σ constants for the tests. These models presented basement and Moho reliefs closer to the estimated surfaces in the Figure 2. These results (Figures 4, 6 and 8) show predicted gravity disturbance and lithostatic stress curves with the same behavior that presented in the Figure 2.

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8 Application to synthetic data (sediment and SDR density error). Results obtained in Step 3 by using $\sigma = 8$ (equation **??**). The remaining informations are the same shown in the caption of Figure 1.

Geological meaning	$\rho^{(\alpha)}$ (kg/m^3)	$\Delta\rho^{(\alpha)}$ (kg/m^3)	α
water	1030	-1840	w
sediments	2350	-520	1
SDR	2855	-15	2
continental crust	2870	0	cc
oceanic crust	2885	15	oc
mantle	3240	370	m

Table 1: Properties of the volcanic margin model. The model extends from $y = 0$ km to $y = 383$ km, the Continent-Ocean Transition (COT) is located at $y_{COT} = 350$ km and the reference Moho is located at $S_0 + \Delta S = 43.2$ km, where $\Delta S = 2.2$ km. The density contrasts $\Delta\rho^{(\alpha)}$ are defined with respect to the reference value $\rho^{(r)} = 2870$ kg/m^3, which coincides with the density $\rho^{(cc)}$ attributed to the continental crust.

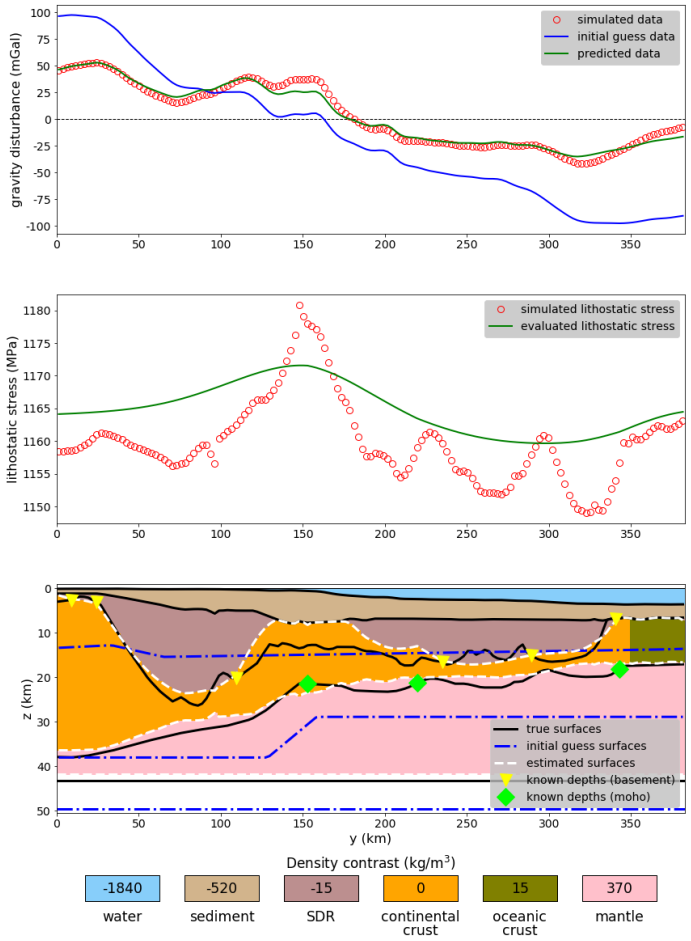

Figure 1: Application to synthetic data. Results obtained in Step 2. (Bottom panel) Estimated and true surfaces, initial basement and Moho used in the inversion (initial guess) and known depths at basement and Moho. (Middle panel) True and estimated lithostatic stress curves computed by using equation **??**. The values are multiplied by a constant gravity value equal to 9.81 m/s^2. (Upper panel) Gravity disturbance data produced by the volcanic margin model (simulated data), by the estimated model (predicted data) and by the model used as initial guess in the inversion (initial guess data). The contour of the prisms forming the interpretation model were omitted. The density contrasts were defined according to Table 1.

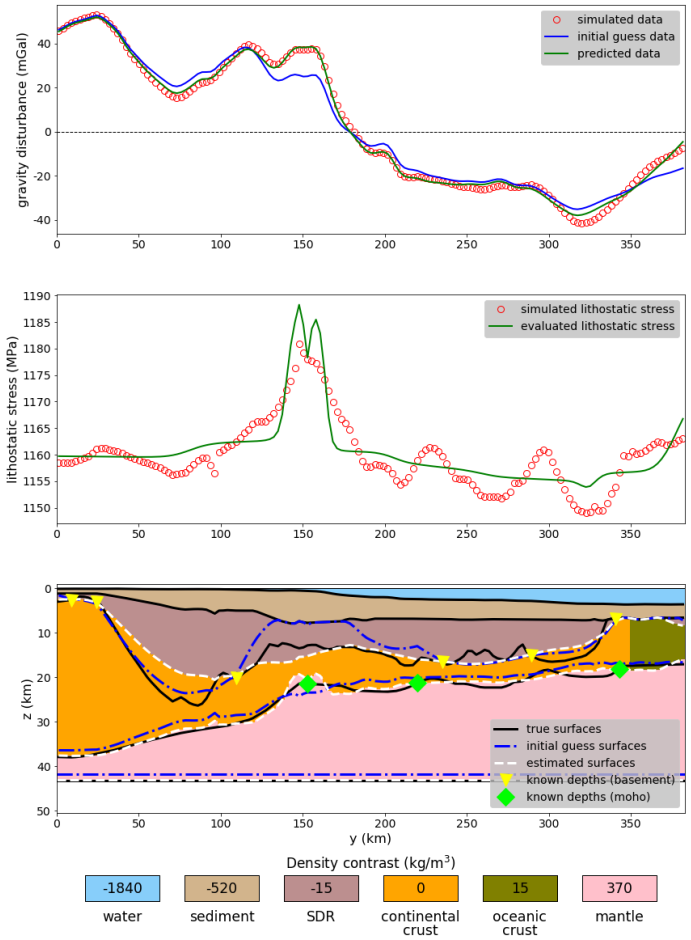

Figure 2: Application to synthetic data. Results obtained in Step 3 by using $\sigma = 22$ (equation **??**). The remaining informations are the same shown in the caption of Figure 1.

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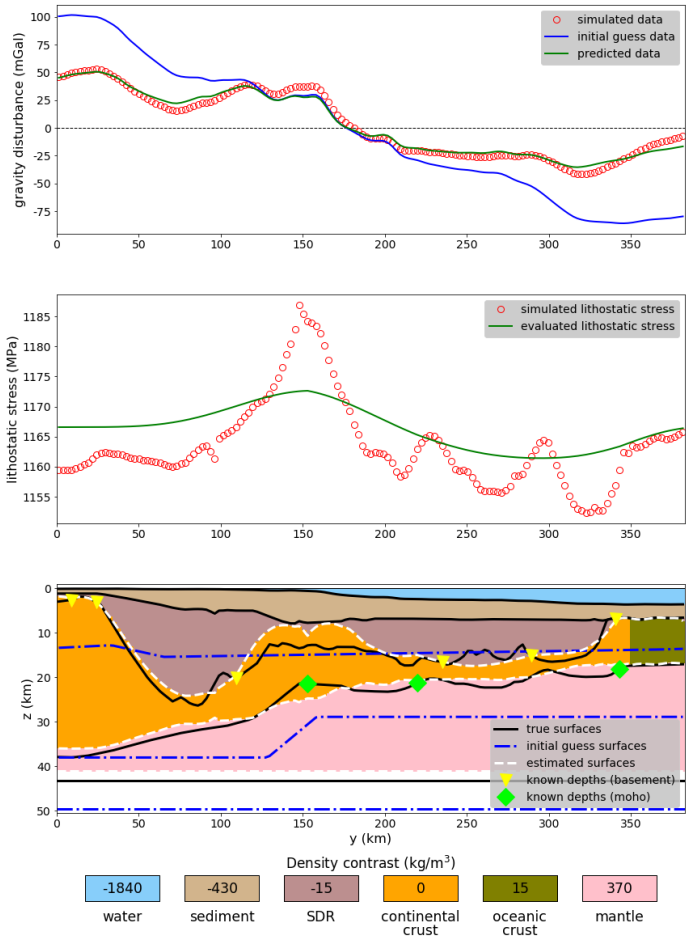

Figure 3: Application to synthetic data (sediment density error: $\approx 4\%$). Results obtained in Step 2. The remaining informations are the same shown in the caption of Figure 1.

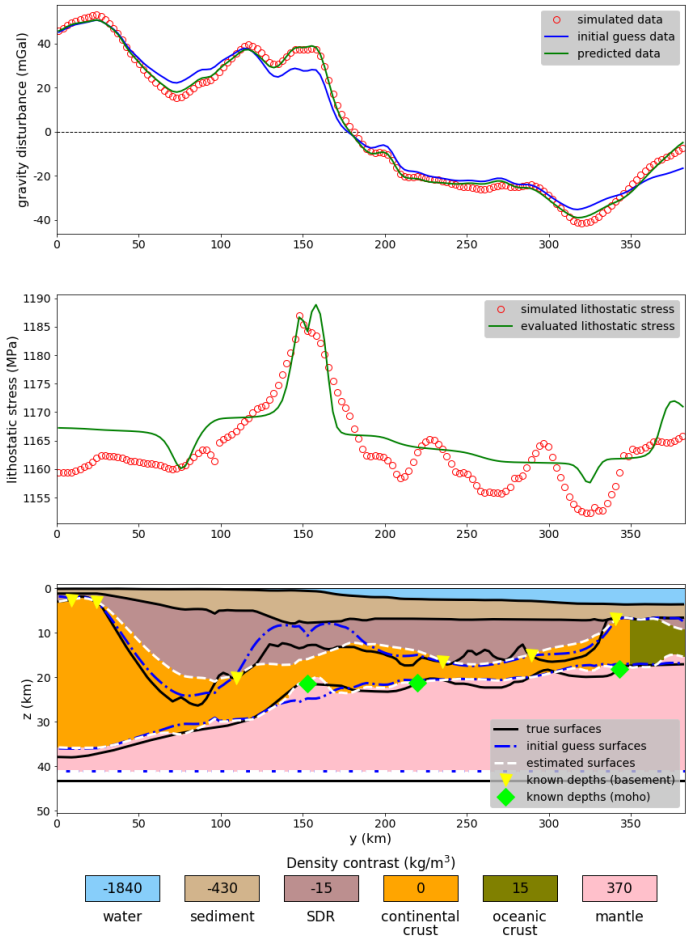

Figure 4: Application to synthetic data (sediment density error: $\approx 4\%$). Results obtained in Step 3 by using $\sigma = 15$ (equation **??**). The remaining informations are the same shown in the caption of Figure 1.

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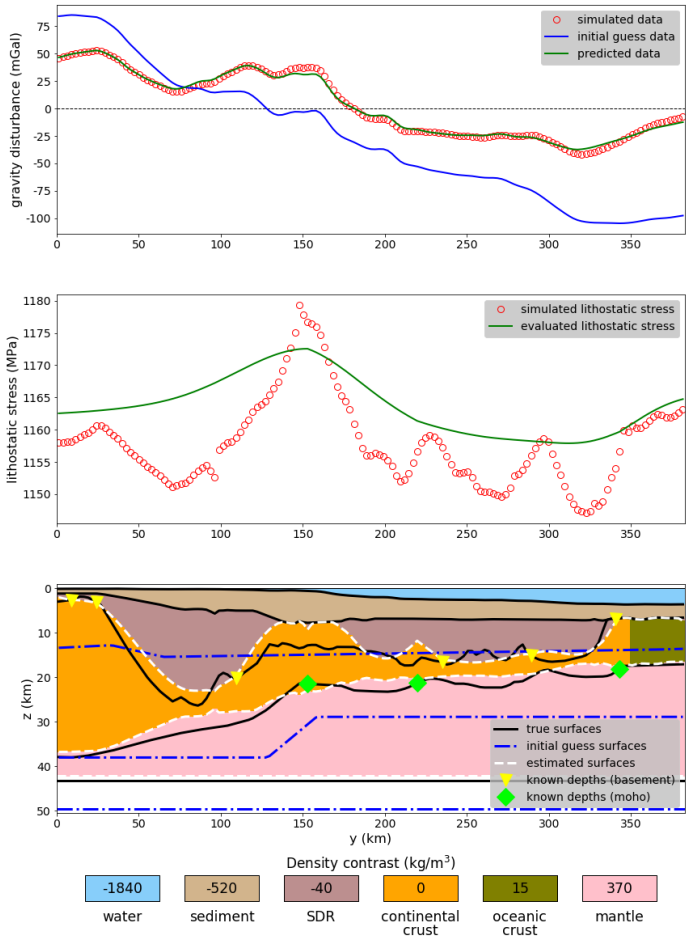

Figure 5: Application to synthetic data (SDR density error: $\approx 1\%$). Results obtained in Step 2. The remaining informations are the same shown in the caption of Figure 1.

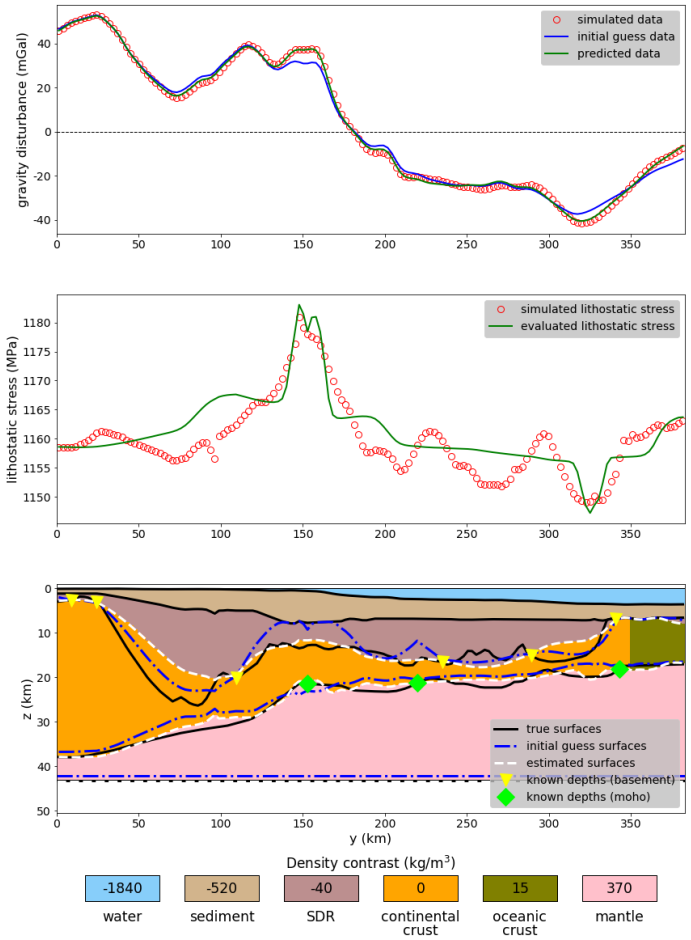

Figure 6: Application to synthetic data (SDR density error: $\approx 1\%$). Results obtained in Step 3 by using $\sigma = 5$ (equation **??**). The remaining informations are the same shown in the caption of Figure 1.

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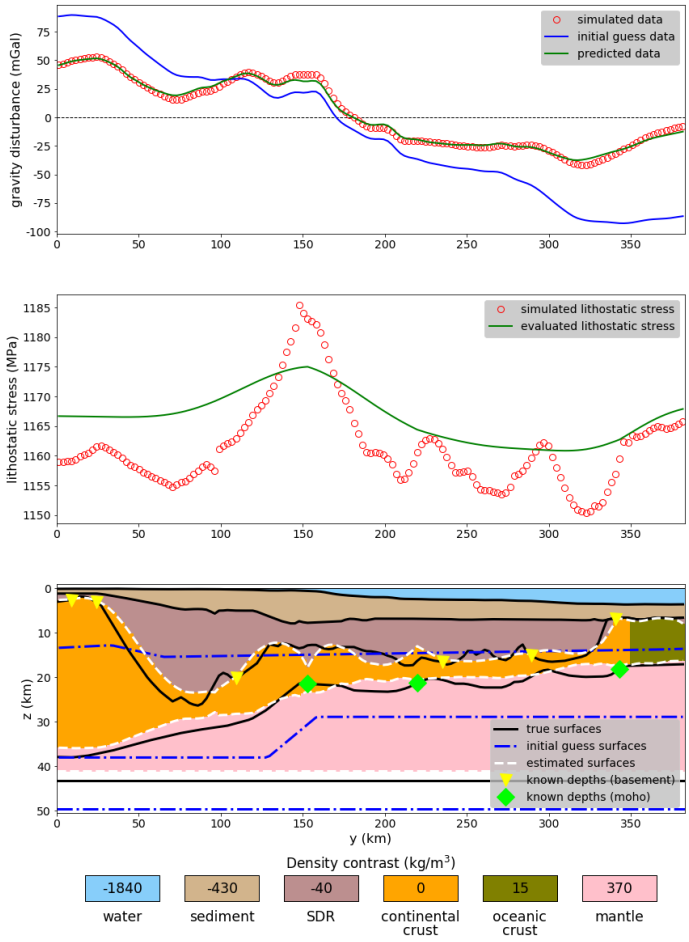

Figure 7: Application to synthetic data (sediment and SDR density error). Results obtained in Step 2. The remaining informations are the same shown in the caption of Figure 1.

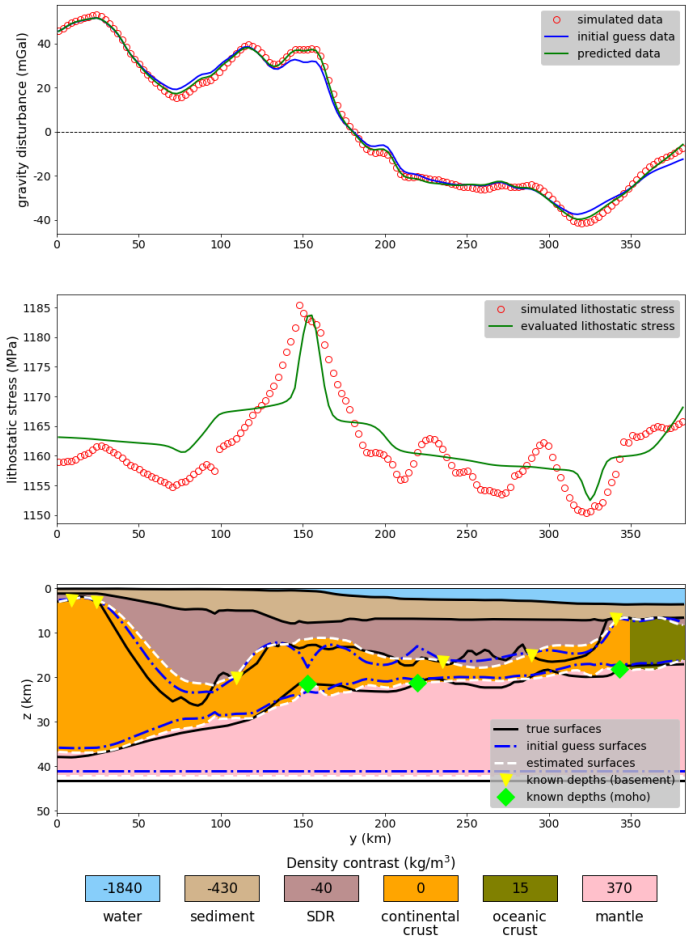

Figure 8: Application to synthetic data (sediment and SDR density error). Results obtained in Step 3 by using $\sigma = 8$ (equation **??**). The remaining informations are the same shown in the caption of Figure 1.

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