CrossMark

ERRATUM

Erratum to: A Stabilized Mixed Finite Element Method for Elliptic Optimal Control Problems

Hongfei Fu[1] · **Hongxing Rui[2]** · **Jian Hou[3]** ·
Haihong Li[1]

Erratum to: J Sci Comput
DOI 10.1007/s10915-015-0050-3

The authors would like to correct the numerical results of Section 6 published in the original version as follows:

Example 6.1 For the first example, we take the stabilized parameters $\mu = 0.2$ and $\delta = 0.5$.

Piecewise linear C^0 element is adopted for the approximation of the flux σ. The numerical results and main CPU time are presented in Table 1, and numerical plots for the control, the state, and the flux state are shown in Figs. 1, 2, and 3, respectively.

Example 6.2 For the second example, we consider the stabilized parameters $\mu = \delta = 0.5$.

Table 2 shows that a first-order convergence is obtained for the control, which is well matched with the theoretical analysis. Figures 4, 5, and 6 show the approximate profiles of the control, the state, and the flux state, respectively, when the lowest order RT element is adopted for the approximation of the flux σ.

Both numerical examples support the theoretical analysis very well.

✉ Hongfei Fu
  hongfeifu@upc.edu.cn

  Hongxing Rui
  hxrui@sdu.edu.cn

  Jian Hou
  houjian@upc.edu.cn

[1] College of Science, China University of Petroleum, Qingdao 266580, China

[2] School of Mathematics, Shandong University, Jinan 250100, China

[3] College of Petroleum Engineering, China University of Petroleum, Qingdao 266580, China

Table 1 Example 1 with piecewise linear C^0 elements for σ_h

u: DoF	$\|u - u_h\|_{L^2(\Omega)}$	y/σ: DoF	$\|\|\{y - y_h, \sigma - \sigma_h\}\|\|_\delta$	CPU time (s)
150	6.44E−02	92/92	6.17E−01	1.67
602	3.22E−02	334/334	3.07E−01	11.13
2390	1.54E−02	1260/1260	1.52E−01	76.58
9496	7.71E−03	4877/4877	7.59E−02	433.61
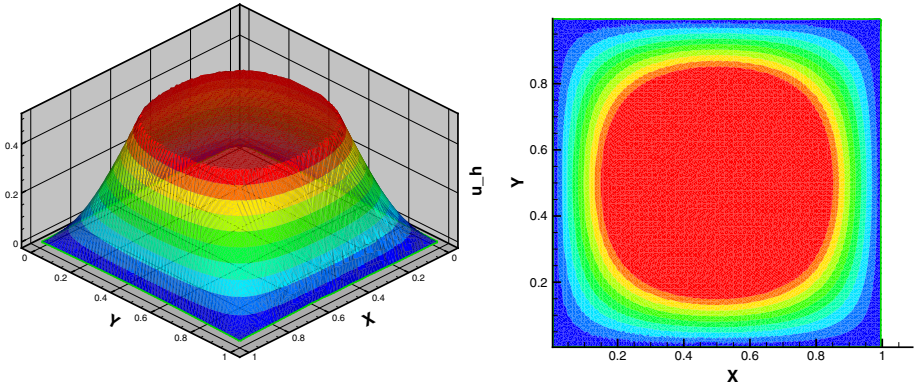
Fig. 1 Approximate control u_h (*left*) and its contour line (*right*) for Example 1 with $\mu = 0.2$ and $\delta = 0.5$

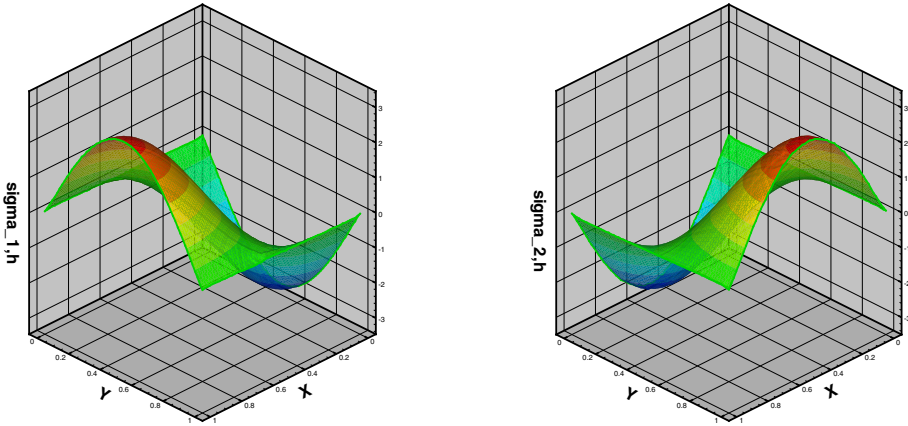**Fig. 2** Approximate state y_h for Example 1 with $\mu = 0.2$ and $\delta = 0.5$
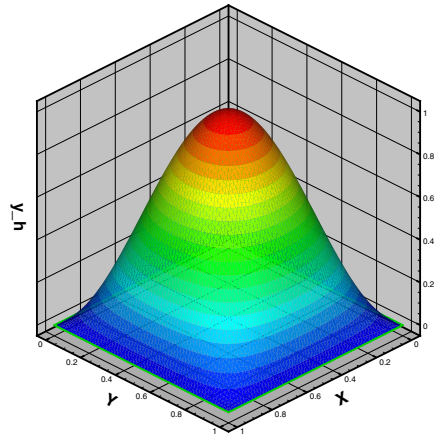
Fig. 3 Approximate flux state σ_h for Example 1 with $\mu = 0.2$ and $\delta = 0.5$

Table 2 Example 2 with the lowest order RT elements for σ_h

u: DoF	$\|u - u_h\|_{L^2(\Omega)}$	y/σ: DoF	$\|\|\{y - y_h, \sigma - \sigma_h\}\|\|_\delta$	CPU time (s)
150	5.18E−02	92/241	3.81E−02	2.78
602	2.62E−02	334/935	1.89E−02	20.98
2390	1.30E−02	1260/3649	9.47E−03	88.34
9496	6.52E−03	4877/14372	4.72E−03	469.59
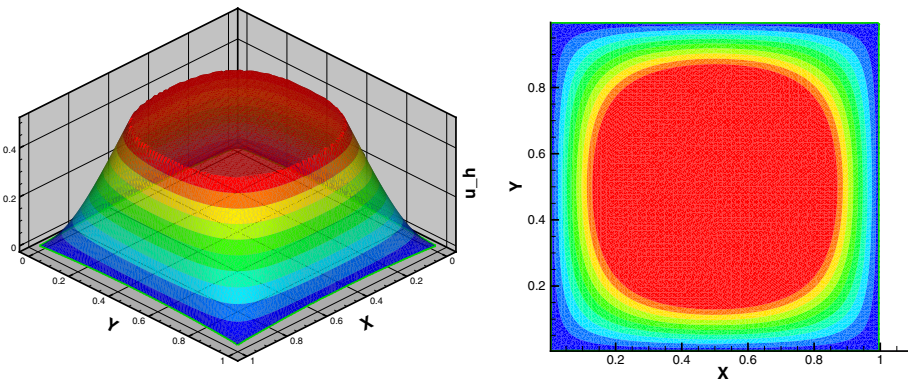
Fig. 4 Approximate control u_h (*left*) and its contour line (*right*) for Example 2 with $\mu = \delta = 0.5$

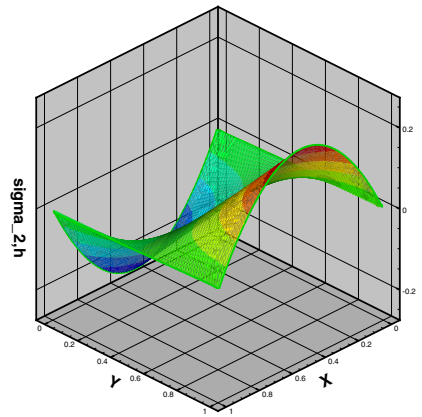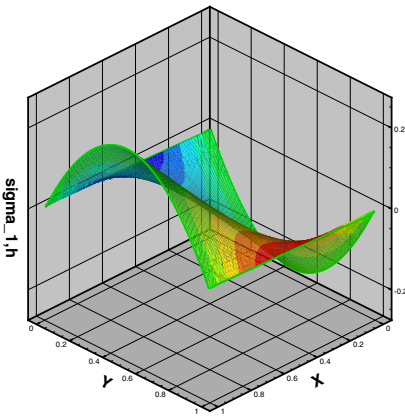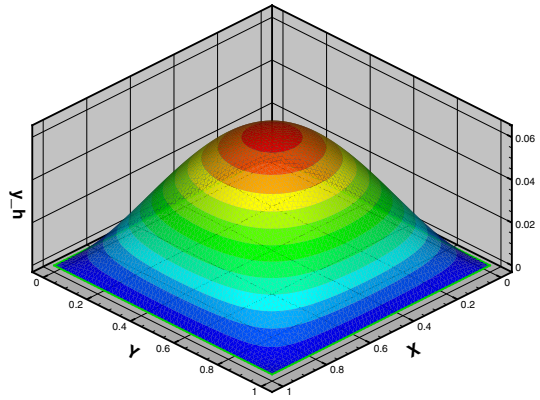**Fig. 5** Approximate state y_h for Example 2 with $\mu = \delta = 0.5$

Fig. 6 Approximate flux state σ_h for Example 2 with $\mu = \delta = 0.5$