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Correction to "Decay estimates on solutions of the linearized compressible Navier-Stokes equation around a Poiseuille type flow" in J. Math-for-Ind. 2A (2010), pp. 39–56

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Abstract. Theorem 3.2 of [1] in J. Math-for-Ind. 2A (2010), pp. 39–56, contains an error. We modify the assumption on the initial value in order that Theorem 3.2 holds true.

Theorem 3.2 of [1] contains an error. The assumption on the initial value $u_0 \in L^1(\mathbf{R}^{n-1}; L^2(0,1))$ should be modified to $u_0 \in L^1(\mathbf{R}^{n-1}; H^1(0,1) \times L^2(0,1))$. The corrected version of the theorem is thus stated as follows.

Theorem 3.2. *There exist constants $\nu_0 > 0$, $\gamma_0 > 0$ and ω_0 such that if $\nu \geq \nu_0$, $\gamma^2/(2\nu + \nu') \geq \gamma_0^2$ and $|\omega| \leq \omega_0$, then the estimates*

$$\begin{aligned}&\|\partial_{x'}^k \partial_{x_n}^l \mathscr{U}(t) u_0\|_2 \\ &\quad \leq C\{t^{-\frac{n-1}{4}-\frac{k}{2}} \|u_0\|_{L^1(\mathbf{R}^{n-1}; H^1(0,1)\times L^2(0,1))} \\ &\qquad + e^{-dt}(\|u_0\|_{H^1\times L^2} + \|\partial_{x'} w_0\|_2)\} \quad (k + l \leq 1)\end{aligned}$$

hold uniformly for $t \geq 1$, $u_0 = {}^T(\phi_0, w_0) \in H^1 \times L^2$ with $\partial_{x'} w_0 \in L^2$ and $u_0 \in L^1(\mathbf{R}^{n-1}; H^1(0,1) \times L^2(0,1))$. Here d is a positive constant.

Correspondingly, Proposition 4.2 should be corrected as follows.

Proposition 4.2. *For each $R > 0$, there exist $\nu_0 > 0$, $\gamma_0 > 0$ and $\omega_0 > 0$ such that if $\nu \geq \nu_0$, $\gamma^2/(\nu + \tilde{\nu}) \geq \gamma_0^2$ and $|\omega| \leq \omega_0$, then the estimate*

$$\|\partial_{x'}^k \partial_{x_n}^l U_1(t) u_0\|_2 \leq C t^{-\frac{n-1}{4}-\frac{k}{2}} \|u_0\|_{L^1(\mathbf{R}^{n-1}; H^1(0,1)\times L^2(0,1))}$$

holds for $t \geq 1$, $k, l = 0, 1$.

As for the proof, the final inequality in the proof of Proposition 4.2 (in the left column, page 51)

$$\sup_{|\xi'|\leq R} E_3(\widehat{u}(\xi', \cdot, 1)) \leq C\|u_0\|^2_{L^1(\mathbf{R}^{n-1}; L^2(0,1))}.$$

is incorrect. It should be modified to

$$\sup_{|\xi'|\leq R} E_3(\widehat{u}(\xi', \cdot, 1)) \leq C\|u_0\|^2_{L^1(\mathbf{R}^{n-1}; H^1(0,1)\times L^2(0,1))}.$$

References

[1] Y. Kagei, Y. Nagafuchi and T. Sudo, Decay estimates on solutions of the linearized compressible Navier-Stokes equation around a Poiseuille type flow, J. Math-for-Ind., **2A** (2010), pp. 39–56.

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