Errata: "Highly energy-conservative finite difference method for the cylindrical coordinate system" [K. Fukagata & N. Kasagi, *J. Comput. Phys.* **181**, 478-498 (2002)]

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Version: private note

There are two obvious typos in the published version [1].

1. In Eq. (11), the denominator of the first term, i.e., Δ_r, should read Δr. The correct expression is:

$$
\begin{aligned}
h_{r,\,i+\frac{1}{2}\,j\,k} \;=\; & -\frac{1}{r_{i+\frac{1}{2}}\Delta r_{i+\frac{1}{2}}}\left[\overline{(ru_r)}^{i}_{i+1\,j\,k}\,\overline{u_r}^{i}_{i+1\,j\,k}-\overline{(ru_r)}^{i}_{i\,j\,k}\,\overline{u_r}^{i}_{i\,j\,k}\right] \\
& -\frac{1}{r_{i+\frac{1}{2}}\Delta\theta}\left[\widehat{u_\theta}^{\,i}_{i+\frac{1}{2}\;j+\frac{1}{2}\;k}\;\overline{u_r}^{j}_{i+\frac{1}{2}\;j+\frac{1}{2}\;k}-\widehat{u_\theta}^{\,i}_{i+\frac{1}{2}\;j-\frac{1}{2}\;k}\;\overline{u_r}^{j}_{i+\frac{1}{2}\;j-\frac{1}{2}\;k}\right] \\
& -\frac{1}{\Delta z}\left[\widehat{u_z}^{\,i}_{i+\frac{1}{2}\;j\,k+\frac{1}{2}}\overline{u_r}^{k}_{i+\frac{1}{2}\;j\,k+\frac{1}{2}}-\widehat{u_z}^{\,i}_{i+\frac{1}{2}\;j\,k-\frac{1}{2}}\overline{u_r}^{k}_{i+\frac{1}{2}\;j\,k-\frac{1}{2}}\right]\,.
\end{aligned}
$$

2. In Eq. (28), the subscript to θ should read $j+\frac{1}{2}$. The correct expression is:

$$
\begin{cases}
u_{x,\,k} \;=\; -\dfrac{2}{N_\theta}\displaystyle\sum_{j=0}^{N_\theta-1} u_{\theta,\,1\;j+\frac{1}{2}\;k}\sin\theta_{j+\frac{1}{2}}\,, \\
u_{y,\,k} \;=\; \dfrac{2}{N_\theta}\displaystyle\sum_{j=0}^{N_\theta-1} u_{\theta,\,1\;j+\frac{1}{2}\;k}\cos\theta_{j+\frac{1}{2}}\,.
\end{cases}
$$

REFERENCES

[1] K. Fukagata and N. Kasagi, Highly energy-conservative finite difference method for the cylindrical coordinate system, *J. Comput. Phys.* **181**, 478-498 (2002).