

# Erratum: Dynamics of Dusty Vortices I: Extensions and limitations of the terminal velocity approximation

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After publication of Lovascio & Paardekooper (2019) it was brought to our attention that two equations in the paper were missing terms. These omissions do not affect the results or conclusions of the paper, but require correction none the less. In the original paper, equation (8), describing the evolution of the relative velocity of gas and dust, should read:

$$\partial_t \Delta \mathbf{u} + (\Delta \mathbf{u} \cdot \nabla) \mathbf{u} + (\Delta \mathbf{u} \cdot \nabla) \left( \frac{P}{c_s^2 \rho} \Delta \mathbf{u} \right) + (\mathbf{u} \cdot \nabla) \Delta \mathbf{u} - \left( 1 - \frac{P}{c_s^2 \rho} \right) (\Delta \mathbf{u} \cdot \nabla) \Delta \mathbf{u} = -\frac{\Delta \mathbf{u}}{t_s} + \frac{c_s^2 \nabla P}{P} - \frac{c_s^2 \nabla \cdot \mathbf{T}_g}{P}, \quad (1)$$

which then agrees with equation (6) of Lebreuilly, Commerçon & Laibe (2019) in the inviscid limit. Similarly, equation (12) should read

$$\partial_t \Delta \tilde{\mathbf{u}} + (\Delta \tilde{\mathbf{u}} \cdot \nabla) \tilde{\mathbf{u}} + (\Delta \tilde{\mathbf{u}} \cdot \nabla) \left( \frac{\tilde{f}_0 \tilde{P}}{\tilde{\rho}} \Delta \tilde{\mathbf{u}} \right) + (\tilde{\mathbf{u}} \cdot \nabla) \Delta \tilde{\mathbf{u}} - \left( 1 - \frac{\tilde{f}_0 \tilde{P}}{\tilde{\rho}} \right) (\Delta \tilde{\mathbf{u}} \cdot \nabla) \Delta \tilde{\mathbf{u}} = -\frac{\Delta \tilde{\mathbf{u}}}{\tilde{t}_s \text{St}} + \frac{\nabla \tilde{P}}{\tilde{P} \text{Ma}^2} - \frac{\nabla \cdot \tilde{\mathbf{T}}_g}{\tilde{P} \text{Re}}. \quad (2)$$

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For one-dimensional, unidirectional flow, discussed in the paper, the additional terms vanish and the original equations (8) and (12) are recovered. All additional terms are at least first order in  $\Delta \mathbf{u}$  and thus not part of the terminal velocity approximation. All results in the paper are therefore unaffected.

## ACKNOWLEDGEMENTS

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## REFERENCES

- Lebreuilly U., Commerçon B., Laibe G., 2019, *A&A*, 626, A96  
Lovascio F., Paardekooper S.-J., 2019, *MNRAS*, 488, 5290

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