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# PyMPDATA 1.0.11

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```
pip install PyMPDATA
```



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Numba-accelerated Pythonic implementation of MPDATA with examples in Python, Julia and Matlab

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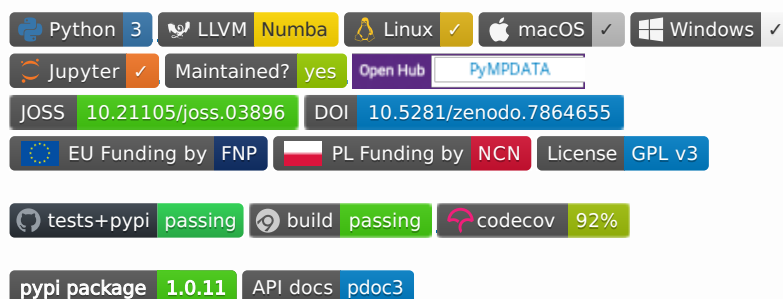
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## Project description

### PyMPDATA



PyMPDATA is a high-performance Numba-accelerated Pythonic implementation of the MPDATA algorithm of Smolarkiewicz et al. used in geophysical fluid dynamics and beyond. MPDATA numerically solves generalised transport equations - partial differential equations used to model conservation/balance laws, scalar-transport problems, convection-diffusion phenomena. As of the current version, PyMPDATA supports homogeneous transport in 1D, 2D and 3D using structured meshes, optionally generalised by employment of a Jacobian of coordinate transformation. PyMPDATA includes implementation of a set of MPDATA variants including the non-oscillatory option, infinite-gauge, divergent-flow, double-pass donor cell (DPDC) and third-order-terms options. It also features support for integration of Fickian-terms in advection-diffusion problems using the pseudo-transport velocity approach. In 2D and 3D simulations, domain-decomposition is used for multi-threaded parallelism.

PyMPDATA is engineered purely in Python targeting both performance and usability, the latter encompassing research users', developers' and maintainers' perspectives. From researcher's perspective, PyMPDATA offers hassle-free