**“ply2SPHERA\_perimeter v.3.0”: documentation file**

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“The minor tool “ply2SPHERA\_perimeter v.3.0” is realised by RSE SpA thanks to the funding “Fondo di Ricerca per il Sistema Elettrico” within the frame of a Program Agreement between RSE SpA and the Italian Ministry of Economic Development (Ministero dello Sviluppo Economico).”

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## Description and references

“ply2SPHERA\_perimeter v.3.0” (RSE SpA) is a minor pre-processing tool of the SPH code SPHERA v.10.0.0 (RSE SpA, [2]). It deals with the format conversion from “.ply” to the format of the sections “VERTICES” and “FACES” of SPHERA main input file to describe the perimeter of a 3D zone (for 3D simulations) or a 2D zone (for 2D simulations).

## Tutorials

ply2SPHERA\_perimeter is validated on 4 tutorials (following sub-sections), each one having possible variants. Some of the tutorials are published on International Journals. Other minor test cases only represent very simple configurations.

## “db\_Alpe\_Gera”

This tutorial is described in Amicarelli et al. (2020, [4]). The paper version available on ResearchGate might help in case the published version is unavailable.

## “db\_Alpe\_Gera\_Lanzada\_substations”

This tutorial is described in Amicarelli (2021, [3]). The paper version available on ResearchGate might help in case the published version is unavailable.

## “edb\_ICOLD”

This tutorial is described in Amicarelli et al. (2017, [1]). The paper version available on ResearchGate might help in case the published version is unavailable.

## “spherical\_Couette\_flows”

This tutorial is described in Amicarelli et al. (2022, [5]). The paper version available on ResearchGate might help in case the published version is unavailable.

## References

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2. SPHERA (RSE SpA), https://github.com
3. A. Amicarelli, S. Manenti and M. Paggi, “SPH modelling of dam-break floods, with damage assessment to electrical substations,” International Journal of Computational Fluid Dynamics, vol. 35, no. 1-2, pp. 3-21; DOI 10.1080/10618562.2020.1811240, 2021.
4. A. Amicarelli, S. Manenti, R. Albano, G. Agate, M. Paggi, L. Longoni, D. Mirauda, L. Ziane, G. Viccione, S. Todeschini, A. Sole, L. Baldini, D. Brambilla, M. Papini, M. Khellaf, B. Tagliafierro, L. Sarno and G. Pirovano, “SPHERA v.9.0.0: a Computational Fluid Dynamics research code, based on the Smoothed Particle Hydrodynamics mesh-less method,” Computer Physics Communications, vol. 250, pp. 107157, https://doi.org/10.1016/j.cpc.2020.107157, 2020.
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