

PIERRE AUGER MULTIPLEX

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Reference and Acknowledgments

This README file accompanies the dataset representing the multiplex coauthorship network in the internal report repository of the Pierre Auger Collaboration (<http://www.auger.org/>), the largest team of scientists working about ultra-high energy cosmic rays. If you use this dataset in your work either for analysis or for visualization, you should acknowledge/cite the following paper:

“Identifying Modular Flows on Multilayer Networks Reveals Highly Overlapping Organization in Interconnected Systems”

Manlio De Domenico, Andrea Lancichinetti, Alex Arenas, and Martin Rosvall
Physical Review X 5, 011027 (2015)

that can be found at the following URLs:

<http://journals.aps.org/prx/abstract/10.1103/PhysRevX.5.011027>

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Visit

PLEXMATH: <http://www.plexmath.eu/>

ALEPHSYS: <http://deim.urv.cat/~alephsys/>

for further details.

Description of the dataset

The multiplex consists of layers corresponding to different working tasks within the Pierre Auger Collaboration. We considered all submissions between 2010 and 2012 and assigned each report to L=16 layers according to its keywords and its content, with manual disambiguation to avoid spurious results from an automated process. The authors acknowledge all members of the Pierre Auger Collaboration for kindly providing access to the metadata of its repository for internal technical reports and Dr. M. Settimo for kindly helping to classify all reports to the proper task(s).

The multiplex network used in the paper makes use of 16 layers corresponding to:

1. Neutrinos
2. Detector

3. Enhancements
4. Anisotropy
5. Point-source
6. Mass-composition
7. Horizontal
8. Hybrid-reconstruction
9. Spectrum
10. Photons
11. Atmospheric
12. SD-reconstruction
13. Hadronic-interactions
14. Exotics
15. Magnetic
16. Astrophysical-scenarios

There are 514 nodes, labelled with integer ID between 1 and 514, and 7153 coauthorship connections. The multiplex is undirected (with only one direction specified) and weighted, stored as edges list in the file

```
pierreauger_multiplex.edges
```

with format

```
layerID nodeID nodeID weight
```

The IDs of all layers are stored in

```
pierreauger_layers.txt
```

The IDs of nodes are not provided to preserve the privacy of the original authors.

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Contacts

If you find any error in the dataset or you have questions, please contact

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