Non-thermal micro black hole decay searches in the UHECR and neutrino data

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The possibility for cosmic ray experiments or neutrino observatories to discover non-thermal small black holes with masses in the TeV range will be discussed. These black holes would result due to the impact between ultra high energy cosmic rays or neutrinos with nuclei (from the upper atmosphere, respectively in water or ice for the case of neutrinos) and decay instantaneously. As their masses are close to the Planck scale, these holes would typically decay into two particles emitted back-to-back. The resulting spatially separated but simultaneous showers could be measured by ground based or future space based cosmic ray observatories or by neutrino telescopes.

The presentation is based on two articles: one of them was recently published in JHEP (arXiv:1204.2520) and the other one is going through peer review (arXiv:1303.4603).