



Correction to: The fundamental plane of FSRQs based on the black hole spin-mass energy

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Correction to: *Astrophys. Space Sci.* (2023) 368:69
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In this article, the references to Ackermann et al. (2011), Blandford and Koenigl (1979), Daly (2022), McClintock et al. (2014), Netzer (1990), Ünal and Loeb (2020), and Xiao et al. (2023) were incorrect as specified under the heading **Incorrect** below. They should have been as specified further below, under the heading **Correct**. As can be seen in the last items in both lists, the citations of (Xiao et al. 2023) in the text (in the 1st, 4th and 5th sentences of the 2nd paragraph of section 1) should have been citations of (Zhu et al. 2023). Also, the citation of Blandford and Koenigl (1979) should have been of Blandford and Levinson (1995), and the last sentence of the 2nd paragraph incorrectly read “The unique observational properties of γ -rays in Blazars can be attributed to the relativistic jets, which relates γ -ray luminosity to jet power for the fundamental plane of Blazars, as proposed by Blandford and Koenigl (1979)”, and should have read “The unique observational properties of γ -rays in Blazars can be attributed to the relativistic jets (e.g. Bland-

ford and Levinson 1995), which relates γ -ray luminosity to jet power for the fundamental plane of Blazars.”

Furthermore, there should not have been a second citation of McClintock et al. (2014) in the following sentences in the last paragraph of section 1:

“These models propose that the spin of the black hole plays a crucial role in the production of both emitted radiation and jets (McClintock et al. 2014). Therefore, deviations from the fundamental plane may result from the spin of the black hole (McClintock et al. 2014).”

Incorrect

- Ackermann, M., Ajello, M., Allafort, A., Antolini, E., et al.: *Astrophys. J.* **171**, 37 (2011)
- Blandford, R.D., Koenigl, A.: *Astrophys. J. Lett.* **20**, 15 (1979)
- Daly, R.A.: *Mon. Not. R. Astron. Soc.* **17**, 1 (2022)
- McClintock, B.H., Norton, A.A., Li, J.: *Astrophys. J.* **14**, 28 (2014)
- Netzer, H.: In: *Active Galactic Nuclei*, p. 57. Springer, Berlin (1990)
- Ünal, C., Loeb, A.: *Mon. Not. R. Astron. Soc.* **1**, 8 (2020)
- Xiao, H.B., Zhu, J.T., Fan, J.H., et al.: *Mon. Not. R. Astron. Soc.* **30**, 1 (2023)

Correct

- Ackermann, M., Ajello, M., Allafort, A., Antolini, E., et al.: The second catalog of active galactic nuclei detected by the Fermi Large Area Telescope. *Astrophys. J.* **743**, 171 (2011). <https://doi.org/10.1088/0004-637X/743/2/171>
- Blandford, R.D., Levinson, A.: Pair cascades in extragalactic jets. I. Gamma rays. *Astrophys. J.* **441**, 79–95 (1995)
- Daly, R.A.: Robust supermassive black hole spin mass-energy characteristics: a new method and results. *Mon. Not. R. Astron. Soc.* **517**(4), 5144–5159 (2022). <https://doi.org/10.1093/mnras/stac2976>
- McClintock, J.E., Narayan, R., Steiner, J.F.: Black hole spin via continuum fitting and the role of spin in powering

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transient jets. *Space Sci Rev* **183**, 295–322 (2014). <https://doi.org/10.1007/s11214-013-0003-9>

Netzer, H.: AGN emission lines. In: Swiss Society for Astrophysics and Astronomy, Courvoisier, T. J.-L., Mayor, M. (Eds.) *Active Galactic Nuclei*, pp. 57–158. Saas-Fee Advanced Courses, vol 20. Springer, Berlin (1990). https://doi.org/10.1007/3-540-31625-6_2

Ünal, C., Loeb, A.: On spin dependence of the fundamental plane of black hole activity. *Mon. Not. R. Astron. Soc.* **495**(1), 278–284 (2020). <https://doi.org/10.1093/mnras/staa1119>

Zhu, J.T., Lin, C., Xiao, H.B., et al.: Exploring TeV candidates of Fermi blazars through machine learning. *Astrophys J.* **950**, 123 (2023) <https://doi.org/10.3847/1538-4357/acca85>

The original article has been corrected.

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