# X-ray timing and spectral analysis of reverberating active galactic nuclei

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Table 1: The best spectral fits for AGN groups computed to 90% confidence, outlining the model flux (2-10 keV erg cm$^{-2}$ s$^{-1}$), photon index $\Gamma$, ionisation $\log \xi$ (erg cm s$^{-1}$), iron abundance $A_{\rm Fe}$ (solar), reflection fraction $RF$, disk inclination $i$ (deg) and the covering fraction (if applied).

| Source | Group | $F_{2-10}$ kev | $\Gamma_{\texttt{Relxill}}$ | $\log \xi$ | $AF_e$ | RF | $i$ | Cvr Frac |
|---|---|---|---|---|---|---|---|---|
| 1H0707-495 | Combined | $9.27 \times 10^{-13}$ | $3.38^{+0.02}_{-0.02}$ | $2.43^{+0.03}_{-0.03}$ | $0.50^{+0.03}_{-0.00}$ | $2.14^{+0.15}_{-0.15}$ | $74.90^{+0.99}_{-1.52}$ | $0.65^{+0.02}_{-0.02}$ |
| | hi | $1.04 \times 10^{-12}$ | $3.40^{+0.00}_{-0.02}$ | $2.44^{+0.08}_{-0.03}$ | $0.50^{+0.04}_{-0.00}$ | $2.13^{+0.15}_{-0.14}$ | $76.68^{+0.69}_{-1.04}$ | $0.63^{+0.01}_{-0.01}$ |
| | hi cts s$^{-1}$ | $1.02 \times 10^{-12}$ | $3.40^{+0.00}_{-0.02}$ | $2.56^{+0.08}_{-0.08}$ | $0.50^{+0.10}_{-0.00}$ | $2.16^{+0.15}_{-0.14}$ | $80.00^{+0.00}_{-0.70}$ | $0.65^{+0.02}_{-0.02}$ |
| | med | $5.58 \times 10^{-13}$ | $2.80^{+0.14}_{-0.34}$ | $3.58^{+0.16}_{-0.32}$ | $10.00^{+0.00}_{-1.64}$ | $4.98^{+3.30}_{-2.70}$ | $76.10^{+1.09}_{-0.57}$ | $0.83^{+0.03}_{-0.16}$ |
| | lo | $2.99 \times 10^{-13}$ | $2.73^{+0.12}_{-0.16}$ | $2.85^{+0.18}_{-0.15}$ | $9.59^{+0.41}_{-0.49}$ | $9.95^{+0.05}_{-4.98}$ | $80.00^{+0.00}_{-2.99}$ | $0.95^{+0.00}_{-0.01}$ |
| | lo cts s$^{-1}$ | $3.28 \times 10^{-13}$ | $2.95^{+0.35}_{-0.29}$ | $0.87^{+0.57}_{-0.29}$ | $10.00^{+0.00}_{-6.01}$ | $7.31^{+2.69}_{-3.85}$ | $80.00^{+0.00}_{-3.18}$ | $0.63^{+0.16}_{-0.00}$ |
| Ark 564 | Combined | $1.87 \times 10^{-11}$ | $2.36^{+0.06}_{-0.03}$ | $1.30^{+0.40}_{-0.25}$ | $4.99^{+5.01}_{-2.02}$ | $0.64^{+0.44}_{-0.26}$ | $75.60^{+1.81}_{-1.76}$ | – |
| | hi | $1.92 \times 10^{-11}$ | $2.31^{+0.01}_{-0.04}$ | $3.65^{+0.12}_{-0.29}$ | $10.00^{+0.00}_{-2.61}$ | $0.05^{+0.24}_{-0.01}$ | $22.10^{+22.40}_{-21.40}$ | – |
| | lo | $1.09 \times 10^{-11}$ | $2.25^{+0.09}_{-0.09}$ | $3.48^{+0.20}_{-1.37}$ | $0.50^{+0.41}_{-0.00}$ | $8.69^{+1.31}_{-7.09}$ | $80.00^{+0.00}_{-12.40}$ | – |
| IRAS 13224-3809 | Combined | $6.36 \times 10^{-13}$ | $3.25^{+0.04}_{-0.02}$ | $2.13^{+0.06}_{-0.06}$ | $0.50^{+0.11}_{-0.00}$ | $3.20^{+0.36}_{-0.37}$ | $77.51^{+1.39}_{-1.18}$ | $0.60^{+0.02}_{-0.02}$ |
| | hi | $1.23 \times 10^{-12}$ | $3.17^{+0.09}_{-0.08}$ | $1.41^{+0.39}_{-0.01}$ | $2.79^{+1.40}_{-2.02}$ | $2.16^{+0.41}_{-0.24}$ | $77.82^{+2.18}_{-2.19}$ | $0.29^{+0.15}_{-0.09}$ |
| | hi cts s$^{-1}$ | $6.45 \times 10^{-13}$ | $3.13^{+0.09}_{-0.08}$ | $0.92^{+0.17}_{-0.04}$ | $0.50^{+0.24}_{-0.00}$ | $4.02^{+0.99}_{-1.02}$ | $77.29^{+1.48}_{-1.64}$ | $0.22^{+0.07}_{-0.05}$ |
| | med | $5.30 \times 10^{-13}$ | $3.27^{+0.00}_{-0.00}$ | $2.12^{+0.01}_{-0.01}$ | $0.86^{+0.01}_{-0.01}$ | $3.09^{+0.22}_{-0.21}$ | $72.30^{+0.35}_{-0.40}$ | $0.63^{+0.00}_{-0.00}$ |
| | lo | $2.57 \times 10^{-13}$ | $3.14^{+0.06}_{-0.21}$ | $1.87^{+0.16}_{-0.13}$ | $0.50^{+0.71}_{-0.00}$ | $9.24^{+0.76}_{-4.06}$ | $65.46^{+3.35}_{-2.32}$ | $0.74^{+0.03}_{-0.11}$ |
| | lo cts s$^{-1}$ | $4.21 \times 10^{-13}$ | $3.20^{+0.00}_{-0.00}$ | $1.83^{+0.06}_{-0.08}$ | $0.50^{+0.01}_{-0.00}$ | $2.92^{+0.37}_{-0.38}$ | $74.68^{+1.09}_{-1.41}$ | $0.64^{+0.00}_{-0.00}$ |
| MCG-6-30-15 | Combined | $4.12 \times 10^{-11}$ | $2.00^{+0.02}_{-0.12}$ | $3.01^{+0.02}_{-0.12}$ | $10.00^{+0.00}_{-0.36}$ | $10.00^{+0.00}_{-4.99}$ | $32.16^{+2.79}_{-2.42}$ | – |
| | hi | $4.64 \times 10^{-13}$ | $2.00^{+0.13}_{-0.10}$ | $3.01^{+0.03}_{-0.11}$ | $10.00^{+0.00}_{-0.52}$ | $10.00^{+0.00}_{-0.54}$ | $32.06^{+2.47}_{-2.21}$ | – |
| | lo | $3.24 \times 10^{-11}$ | $1.78^{+0.06}_{-0.08}$ | $2.82^{+0.18}_{-0.29}$ | $10.00^{+0.00}_{-5.54}$ | $0.77^{+0.52}_{-0.31}$ | $41.98^{+5.97}_{-5.66}$ | – |
| Mrk 335 | Combined | $9.58 \times 10^{-12}$ | $2.82^{+0.28}_{-0.20}$ | $0.82^{+0.25}_{-0.39}$ | $0.78^{+1.47}_{-0.23}$ | $10.00^{+0.00}_{-4.38}$ | $69.62^{+8.97}_{-26.89}$ | – |
| | hi/2006 | $1.67 \times 10^{-11}$ | $1.00^{+0.05}_{-0.05}$ | $3.10^{+0.04}_{-0.01}$ | $5.00^{+0.99}_{-0.70}$ | $10.00^{+0.00}_{-3.83}$ | $13.02^{+4.47}_{-8.02}$ | – |
| | lo/2009 | $4.83 \times 10^{-12}$ | $1.75^{+0.23}_{-0.12}$ | $0.10^{+3.13}_{-0.10}$ | $3.70^{+6.30}_{-2.50}$ | $1.13^{+4.64}_{-0.74}$ | $32.38^{+8.79}_{-27.38}$ | – |
| Mrk 766 | Combined | $1.53 \times 10^{-11}$ | $1.89^{+0.01}_{-0.01}$ | $3.40^{+0.56}_{-0.04}$ | $0.50^{+0.02}_{-0.00}$ | $4.33^{+0.41}_{-0.08}$ | $29.92^{+6.55}_{-1.25}$ | $0.95^{+0.00}_{-0.13}$ |
| | hi | $2.46 \times 10^{-11}$ | $2.04^{+0.04}_{-0.03}$ | $3.23^{+0.09}_{-0.14}$ | $0.56^{+0.12}_{-0.06}$ | $2.04^{+2.11}_{-0.76}$ | $41.97^{+4.00}_{-3.98}$ | – |
| | med | $1.43 \times 10^{-11}$ | $1.97^{+0.00}_{-0.00}$ | $3.00^{+0.01}_{-0.06}$ | $10.00^{+0.00}_{-0.35}$ | $0.34^{+0.04}_{-0.09}$ | $38.27^{+1.81}_{-2.44}$ | – |
| | lo | $7.32 \times 10^{-12}$ | $1.53^{+0.12}_{-0.09}$ | $3.00^{+0.05}_{-0.15}$ | $2.46^{+2.47}_{-0.71}$ | $2.55^{+7.45}_{-1.18}$ | $19.42^{+10.99}_{-14.42}$ | $0.39^{+0.56}_{-0.08}$ |
| Mrk 841 | Combined | $1.22 \times 10^{-11}$ | $2.00^{+0.49}_{-0.35}$ | $3.00^{+0.29}_{-0.15}$ | $9.61^{+0.39}_{-5.53}$ | $10.00^{+0.00}_{-5.00}$ | $69.04^{+2.26}_{-17.38}$ | – |
| | hi/2001 | $1.55 \times 10^{-11}$ | $2.49^{+0.36}_{-0.08}$ | $3.70^{+0.62}_{-0.73}$ | $1.92^{+2.18}_{-1.14}$ | $2.94^{+7.06}_{-2.40}$ | $43.26^{+26.34}_{-7.97}$ | – |
| | lo/2005 | $1.08 \times 10^{-11}$ | $1.80^{+0.41}_{-0.31}$ | $3.00^{+0.31}_{-0.16}$ | $10.00^{+0.00}_{-0.00}$ | $9.79^{+0.21}_{-0.00}$ | $68.84^{+3.06}_{-10.90}$ | – |

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Table 1 – continued from previous page

| Source | Group | $F_{2-10}$ kev | $\Gamma_{\texttt{Relxill}}$ | $\log \xi$ | $AF_e$ | RF | $i$ | Cvr Frac |
|---|---|---|---|---|---|---|---|---|
| NGC 1365 | Combined | $8.91 \times 10^{-12}$ | $1.59^{+0.04}_{-0.14}$ | $3.00^{+0.02}_{-0.00}$ | $0.70^{+0.24}_{-0.16}$ | $10.00^{+0.00}_{-6.50}$ | $5.00^{+1.98}_{-0.00}$ | $0.95^{+0.00}_{-0.44}$ |
| | hi | $2.16 \times 10^{-11}$ | $3.14^{+0.00}_{-0.01}$ | $0.41^{+0.04}_{-0.03}$ | $0.50^{+0.53}_{-0.00}$ | $10.00^{+0.00}_{-0.21}$ | $6.24^{+14.37}_{-1.24}$ | $0.93^{+0.00}_{-0.02}$ |
| | lo | $6.03 \times 10^{-12}$ | $2.28^{+0.12}_{-0.07}$ | $2.27^{+0.04}_{-0.07}$ | $4.48^{+0.37}_{-0.48}$ | $10.00^{+0.00}_{-0.07}$ | $6.76^{+2.83}_{-1.76}$ | $0.94^{+0.00}_{-0.00}$ |
| NGC 3516 | Combined | $3.27 \times 10^{-11}$ | $1.96^{+0.05}_{-0.07}$ | $3.00^{+0.00}_{-0.01}$ | $5.00^{+0.22}_{-0.15}$ | $8.88^{+1.12}_{-0.54}$ | $50.49^{+1.09}_{-0.83}$ | $0.81^{+0.01}_{-0.01}$ |
| | hi/2006 | $4.53 \times 10^{-11}$ | $1.00^{+0.04}_{-0.00}$ | $2.75^{+0.04}_{-0.04}$ | $0.75^{+0.08}_{-0.07}$ | $1.75^{+0.25}_{-0.29}$ | $54.27^{+1.30}_{-1.55}$ | $0.95^{+0.00}_{-0.00}$ |
| | med/2006 | $3.68 \times 10^{-11}$ | $1.00^{+0.22}_{-0.00}$ | $1.57^{+0.19}_{-0.19}$ | $0.76^{+0.21}_{-0.22}$ | $2.91^{+2.91}_{-0.80}$ | $12.46^{+2.77}_{-7.46}$ | $0.57^{+0.05}_{-0.02}$ |
| | lo/2001 | $1.99 \times 10^{-11}$ | $2.00^{+0.07}_{-0.36}$ | $0.00^{+1.15}_{-0.00}$ | $10.00^{+0.00}_{-6.19}$ | $9.90^{+0.10}_{-1.11}$ | $57.79^{+2.14}_{-3.44}$ | $0.69^{+0.02}_{-0.05}$ |
| NGC 4051 | Combined | $1.64 \times 10^{-11}$ | $1.84^{+0.05}_{-0.04}$ | $3.05^{+0.01}_{-0.04}$ | $0.50^{+0.06}_{-0.00}$ | $10.00^{+0.00}_{-4.78}$ | $5.05^{+0.16}_{-0.05}$ | $0.39^{+0.01}_{-0.05}$ |
| | hi | $2.14 \times 10^{-11}$ | $2.29^{+0.10}_{-0.09}$ | $3.34^{+0.32}_{-0.17}$ | $0.50^{+0.10}_{-0.00}$ | $10.00^{+0.00}_{-5.39}$ | $15.45^{+3.93}_{-10.44}$ | $0.39^{+0.06}_{-0.07}$ |
| | lo | $1.20 \times 10^{-11}$ | $1.49^{+0.12}_{-0.00}$ | $3.04^{+0.00}_{-0.19}$ | $3.91^{+0.92}_{-0.71}$ | $6.75^{+0.31}_{-2.62}$ | $15.56^{+3.73}_{-6.84}$ | $0.39^{+0.00}_{-0.00}$ |
| NGC 4151 | Combined | $9.22 \times 10^{-11}$ | $1.61^{+0.10}_{-0.12}$ | $2.88^{+0.10}_{-0.12}$ | $2.67^{+0.95}_{-1.08}$ | $10.00^{+0.00}_{-4.53}$ | $5.00^{+4.07}_{-0.00}$ | $0.95^{+0.00}_{-0.00}$ |
| | hi | $2.33 \times 10^{-10}$ | $1.10^{+0.00}_{-0.09}$ | $0.00^{+2.71}_{-0.00}$ | $10.00^{+0.00}_{-6.64}$ | $0.65^{+1.02}_{-0.24}$ | $26.57^{+2.28}_{-4.66}$ | $0.95^{+0.00}_{-0.02}$ |
| | lo | $5.32 \times 10^{-11}$ | $2.74^{+0.06}_{-0.01}$ | $1.37^{+0.05}_{-0.04}$ | $0.50^{+0.15}_{-0.00}$ | $7.37^{+0.00}_{-0.44}$ | $5.37^{+2.66}_{-0.37}$ | $0.95^{+0.00}_{-0.00}$ |
| NGC 4395 | Combined | $5.89 \times 10^{-12}$ | $1.06^{+0.00}_{-0.04}$ | $0.34^{+2.66}_{-0.34}$ | $10.00^{+0.00}_{-0.89}$ | $0.40^{+0.00}_{-0.18}$ | $39.23^{+2.71}_{-3.46}$ | $0.64^{+0.07}_{-0.03}$ |
| | hi/2003 | $5.73 \times 10^{-12}$ | $1.00^{+0.00}_{-0.00}$ | $0.00^{+2.35}_{-0.00}$ | $10.00^{+0.00}_{-7.78}$ | $0.87^{+1.03}_{-0.65}$ | $9.54^{+15.46}_{-4.54}$ | $0.60^{+0.04}_{-0.04}$ |
| | lo/2014 | $6.12 \times 10^{-12}$ | $1.26^{+0.16}_{-0.26}$ | $2.39^{+0.59}_{-2.09}$ | $10.00^{+0.00}_{-7.05}$ | $10.00^{+0.00}_{-7.20}$ | $26.66^{+4.63}_{-3.29}$ | $0.95^{+0.00}_{-0.01}$ |
| NGC 5548 | Combined | $3.05 \times 10^{-11}$ | $1.77^{+0.36}_{-0.36}$ | $0.07^{+1.28}_{-0.07}$ | $10.00^{+0.00}_{-6.19}$ | $6.09^{+3.91}_{-1.29}$ | $67.34^{+2.65}_{-1.60}$ | $0.54^{+0.04}_{-0.06}$ |
| | hi/2001 | $4.00 \times 10^{-11}$ | $2.80^{+0.30}_{-0.62}$ | $2.15^{+0.70}_{-0.42}$ | $0.50^{+0.62}_{-0.00}$ | $1.31^{+0.94}_{-0.68}$ | $5.00^{+3.89}_{-0.00}$ | $0.48^{+0.19}_{-0.15}$ |
| | lo | $2.84 \times 10^{-11}$ | $1.60^{+0.20}_{-0.43}$ | $0.70^{+1.16}_{-0.70}$ | $10.00^{+0.00}_{-2.95}$ | $10.00^{+0.00}_{-3.21}$ | $68.81^{+1.47}_{-3.36}$ | $0.84^{+0.00}_{-0.00}$ |
| NGC 6860 | 2009 | $2.23 \times 10^{-11}$ | $3.20^{+0.20}_{-0.31}$ | $3.99^{+0.35}_{-0.44}$ | $9.72^{+0.28}_{-0.21}$ | $2.19^{+1.68}_{-0.89}$ | $44.47^{+6.12}_{-5.26}$ | $0.89^{+0.03}_{-0.03}$ |
| NGC 7314 | Combined | $2.32 \times 10^{-11}$ | $2.09^{+0.04}_{-0.06}$ | $1.78^{+0.07}_{-0.04}$ | $10.00^{+0.00}_{-1.08}$ | $0.68^{+0.14}_{-0.13}$ | $46.68^{+1.57}_{-1.22}$ | $0.95^{+0.00}_{-0.00}$ |
| | hi/2001 | $4.03 \times 10^{-11}$ | $2.15^{+0.18}_{-0.09}$ | $2.75^{+0.32}_{-0.27}$ | $10.00^{+0.00}_{-7.48}$ | $0.57^{+0.25}_{-0.14}$ | $42.35^{+3.52}_{-1.50}$ | $0.95^{+0.00}_{-0.00}$ |
| | lo | $2.07 \times 10^{-11}$ | $2.06^{+0.00}_{-0.66}$ | $1.78^{+0.09}_{-0.05}$ | $10.00^{+0.00}_{-1.49}$ | $0.64^{+0.16}_{-0.15}$ | $46.88^{+1.67}_{-1.47}$ | $0.95^{+0.00}_{-0.00}$ |
| NGC 7469 | Combined | $2.95 \times 10^{-11}$ | $2.39^{+0.14}_{-0.29}$ | $3.48^{+0.75}_{-0.40}$ | $9.24^{+0.76}_{-4.16}$ | $0.30^{+0.14}_{-0.08}$ | $45.05^{+6.14}_{-6.29}$ | $0.47^{+0.14}_{-0.09}$ |
| | hi | $2.91 \times 10^{-11}$ | $2.62^{+0.16}_{-0.27}$ | $3.70^{+0.40}_{-0.65}$ | $10.00^{+0.00}_{-2.27}$ | $0.76^{+0.34}_{-0.27}$ | $74.88^{+2.67}_{-3.16}$ | $0.55^{+0.04}_{-0.13}$ |
| | lo | $2.97 \times 10^{-11}$ | $2.29^{+0.45}_{-0.34}$ | $3.30^{+0.88}_{-0.38}$ | $8.50^{+1.53}_{-4.51}$ | $0.38^{+0.29}_{-0.17}$ | $44.35^{+5.24}_{-9.80}$ | $0.55^{+0.35}_{-0.17}$ |
| PG 1211+143 | Combined | $3.68 \times 10^{-12}$ | $2.06^{+0.07}_{-0.07}$ | $2.40^{+0.30}_{-0.21}$ | $2.27^{+0.99}_{-1.04}$ | $2.61^{+2.15}_{-1.18}$ | $15.73^{+5.13}_{-6.58}$ | – |
| | hi | $3.85 \times 10^{-12}$ | $2.03^{+0.09}_{-0.16}$ | $2.70^{+0.15}_{-0.35}$ | $2.02^{+1.06}_{-0.87}$ | $2.28^{+2.79}_{-0.00}$ | $6.24^{+0.13}_{-1.24}$ | – |
| | lo | $3.31 \times 10^{-12}$ | $1.80^{+0.00}_{-0.00}$ | $2.30^{+0.14}_{-0.14}$ | $0.60^{+0.20}_{-0.10}$ | $1.62^{+1.13}_{-0.00}$ | $24.27^{+1.58}_{-1.84}$ | – |
| PG 1244+026 | Combined | $2.62 \times 10^{-12}$ | $1.94^{+0.33}_{-0.27}$ | $1.45^{+0.56}_{-0.40}$ | $0.79^{+0.46}_{-0.24}$ | $7.61^{+2.39}_{-3.29}$ | $79.97^{+0.03}_{-19.29}$ | – |
| | hi | $2.93 \times 10^{-12}$ | $2.36^{+0.48}_{-0.22}$ | $1.69^{+2.28}_{-1.70}$ | $10.00^{+0.00}_{-9.50}$ | $0.88^{+0.93}_{-0.54}$ | $45.28^{+0.17}_{-2.89}$ | – |

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Table 1 – continued from previous page

| Source | Group | $F_{2-10}$ kev | $\Gamma_{\texttt{Relxill}}$ | $\log \xi$ | $AF_e$ | RF | $i$ | Cvr Frac |
|---|---|---|---|---|---|---|---|---|
| | lo | $2.54 \times 10^{-12}$ | $2.05^{+0.19}_{-0.33}$ | $1.43^{+0.58}_{-0.13}$ | $0.69^{+0.31}_{-0.19}$ | $9.54^{+0.46}_{-5.43}$ | $43.99^{+2.83}_{-3.51}$ | – |
| PG 1247+267 | 2003 | $4.22 \times 10^{-13}$ | $2.53^{+0.57}_{-0.28}$ | $0.05^{+0.75}_{-0.05}$ | $4.63^{+5.37}_{-4.13}$ | $10.00^{+0.00}_{-6.41}$ | $5.00^{+35.51}_{-0.00}$ | $0.73^{+0.22}_{-0.33}$ |
| REJ 1034+396 | Combined | $1.03 \times 10^{-12}$ | $1.54^{+0.24}_{-0.27}$ | $3.30^{+0.13}_{-0.29}$ | $10.00^{+0.00}_{-3.70}$ | $10.00^{+0.00}_{-4.19}$ | $5.00^{+37.72}_{-0.00}$ | – |
| | hi | $7.20 \times 10^{-13}$ | $2.27^{+0.71}_{-0.41}$ | $2.90^{+0.54}_{-2.90}$ | $6.19^{+3.81}_{-5.69}$ | $1.89^{+8.11}_{-1.30}$ | $80.00^{+0.00}_{-5.99}$ | – |
| | lo | $1.12 \times 10^{-12}$ | $1.74^{+0.17}_{-0.14}$ | $0.46^{+3.08}_{-0.46}$ | $10.00^{+0.00}_{-4.30}$ | $10.00^{+0.00}_{-4.37}$ | $5.00^{+35.88}_{-0.00}$ | – |

Table 2: The best spectral fits for 1H0707-495 individual orbits computed to 90% confidence, outlining the model flux (2-10 keV), photon index $\Gamma$, ionisation $\log \xi$, iron abundance $A_{\rm Fe}$, reflection fraction $RF$, disk inclination $i$ (deg), covering fraction and $nH$.

| Obs ID | $F_{2-10}$ kev (erg cm$^{-2}$ s$^{-1}$) | $\Gamma_{\texttt{Relxill}}$ | $\log \xi$ (erg cm s$^{-1}$) | $AF_e$ (solar) | RF | $i$ (Deg) | Cvr Frac | $nH$ ($10^{22}$ cm$^{-2}$) |
|---|---|---|---|---|---|---|---|---|
| 0110890201 | $4.28 \times 10^{-13}$ | $2.64^{+0.01}_{-0.02}$ | $0.76^{+0.31}_{-0.34}$ | $0.50^{+1.94}_{-0.00}$ | $10.00^{+0.00}_{-4.92}$ | $77.95^{+2.04}_{-0.30}$ | $0.74^{+0.01}_{-0.11}$ | $12.80^{+4.02}_{-5.20}$ |
| 0148010301 | $1.12 \times 10^{-12}$ | $3.01^{+0.01}_{-0.01}$ | $0.38^{+2.54}_{-0.14}$ | $0.50^{+1.88}_{-0.00}$ | $4.16^{+1.78}_{-1.63}$ | $80.00^{+0.00}_{-2.41}$ | $0.80^{+0.15}_{-0.19}$ | $259.70^{+143.00}_{-94.40}$ |
| 0506200201 | $2.46 \times 10^{-13}$ | $2.40^{+0.28}_{-0.31}$ | $3.29^{+0.35}_{-0.49}$ | $5.04^{+4.96}_{-2.37}$ | $10.00^{+0.00}_{-8.33}$ | $78.18^{+1.81}_{-64.00}$ | $0.80^{+0.01}_{-0.38}$ | $4.77^{+1.55}_{-1.56}$ |
| 0506200301 | $6.87 \times 10^{-13}$ | $2.49^{+0.18}_{-0.16}$ | $1.11^{+1.22}_{-0.01}$ | $1.08^{+4.06}_{-0.58}$ | $3.55^{+2.65}_{-1.05}$ | $65.77^{+6.08}_{-2.55}$ | $0.12^{+0.64}_{-0.01}$ | $24.51^{+61.00}_{-11.72}$ |
| 0506200401 | $1.07 \times 10^{-12}$ | $3.31^{+0.01}_{-0.01}$ | $1.19^{+0.29}_{-0.01}$ | $0.50^{+2.13}_{-0.00}$ | $3.12^{+0.29}_{-1.50}$ | $67.44^{+11.48}_{-4.13}$ | $0.37^{+0.12}_{-0.10}$ | $2.01^{+1.03}_{-1.58}$ |
| 0506200501 | $1.48 \times 10^{-12}$ | $3.16^{+0.13}_{-0.11}$ | $2.06^{+0.27}_{-0.23}$ | $0.50^{+0.91}_{-0.00}$ | $3.38^{+0.00}_{-0.17}$ | $76.74^{+3.25}_{-3.87}$ | $0.46^{+0.12}_{-0.14}$ | $5.81^{+1.15}_{-1.19}$ |
| 0511580101 | $1.02 \times 10^{-12}$ | $3.14^{+0.12}_{-0.01}$ | $2.31^{+0.13}_{-0.25}$ | $0.59^{+0.62}_{-0.01}$ | $1.60^{+0.42}_{-0.38}$ | $77.10^{+2.53}_{-3.73}$ | $0.54^{+0.01}_{-0.01}$ | $5.32^{+0.69}_{-0.91}$ |
| 0511580201 | $1.46 \times 10^{-12}$ | $3.36^{+0.00}_{-0.01}$ | $2.37^{+0.26}_{-0.21}$ | $0.50^{+0.38}_{-0.00}$ | $1.29^{+0.28}_{-0.24}$ | $79.01^{+0.98}_{-3.31}$ | $0.53^{+0.01}_{-0.01}$ | $3.74^{+1.20}_{-2.98}$ |
| 0511580301 | $1.06 \times 10^{-12}$ | $3.36^{+0.01}_{-0.01}$ | $2.21^{+0.15}_{-0.21}$ | $0.50^{+0.62}_{-0.00}$ | $2.54^{+1.67}_{-0.69}$ | $72.82^{+3.15}_{-3.27}$ | $0.52^{+0.01}_{-0.13}$ | $0.29^{+3.91}_{-0.29}$ |
| 0511580401 | $8.51 \times 10^{-13}$ | $3.40^{+0.00}_{-0.15}$ | $1.92^{+0.17}_{-0.51}$ | $0.50^{+1.85}_{-0.00}$ | $5.42^{+0.80}_{-2.71}$ | $69.29^{+6.91}_{-10.75}$ | $0.51^{+0.00}_{-0.19}$ | $6.99^{+1.42}_{-1.11}$ |
| 0554710801 | $2.79 \times 10^{-13}$ | $2.82^{+0.15}_{-0.22}$ | $1.82^{+0.26}_{-0.45}$ | $0.50^{+0.75}_{-0.00}$ | $10.00^{+0.00}_{-3.47}$ | $80.00^{+0.00}_{-3.91}$ | $0.93^{+0.01}_{-0.01}$ | $5.47^{+1.79}_{-2.77}$ |
| 0653510301 | $7.84 \times 10^{-13}$ | $3.40^{+0.00}_{-0.01}$ | $2.17^{+0.13}_{-0.12}$ | $0.50^{+1.01}_{-0.00}$ | $6.39^{+0.36}_{-0.32}$ | $71.59^{+3.03}_{-4.19}$ | $0.55^{+0.01}_{-0.01}$ | $346.00^{+146.97}_{-31.50}$ |
| 0653510401 | $1.02 \times 10^{-12}$ | $3.25^{+0.00}_{-0.00}$ | $0.76^{+0.01}_{-0.00}$ | $2.28^{+1.22}_{-1.78}$ | $4.19^{+0.24}_{-0.70}$ | $80.00^{+0.00}_{-0.60}$ | $0.95^{+0.00}_{-0.07}$ | $6.48^{+0.66}_{-0.49}$ |
| 0653510501 | $7.58 \times 10^{-13}$ | $3.36^{+0.01}_{-0.01}$ | $2.14^{+0.17}_{-0.34}$ | $0.50^{+0.44}_{-0.00}$ | $3.46^{+1.34}_{-0.86}$ | $73.35^{+2.86}_{-4.62}$ | $0.95^{+0.01}_{-0.14}$ | $235.22^{+59.95}_{-97.90}$ |
| 0653510601 | $7.88 \times 10^{-13}$ | $3.30^{+0.00}_{-0.00}$ | $0.74^{+0.00}_{-0.00}$ | $0.50^{+0.49}_{-0.00}$ | $3.35^{+0.69}_{-0.52}$ | $80.00^{+0.00}_{-0.21}$ | $0.95^{+0.17}_{-0.00}$ | $0.13^{+1.36}_{-1.67}$ |

Table 3: The best spectral fits for IRAS 13224-3809 individual orbits computed to 90% confidence, outlining the model flux (2-10 keV), photon index $\Gamma$, ionisation $\log \xi$, iron abundance $A_{\rm Fe}$, reflection fraction $RF$, disk inclination $i$ (deg), covering fraction and $nH$.

| Obs ID | $F_{2-10}$ kev (erg cm$^{-2}$ s$^{-1}$) | $\Gamma_{\texttt{Relxill}}$ | $\log \xi$ (erg cm s$^{-1}$) | $AF_e$ (solar) | RF | $i$ (Deg) | Cvr Frac | $nH$ ($10^{22}$ cm$^{-2}$) |
|---|---|---|---|---|---|---|---|---|
| 0110890101 | $4.65 \times 10^{-13}$ | $3.21^{+0.17}_{-0.22}$ | $2.26^{+0.24}_{-0.27}$ | $0.50^{+0.39}_{-0.00}$ | $7.46^{+2.54}_{-3.37}$ | $67.55^{+6.60}_{-3.12}$ | $0.70^{+0.07}_{-0.18}$ | $0.97^{+17.50}_{-0.59}$ |
| 0673580101 | $6.24 \times 10^{-13}$ | $3.23^{+0.12}_{-0.09}$ | $1.93^{+0.17}_{-0.40}$ | $6.93^{+3.07}_{-2.55}$ | $2.85^{+0.65}_{-1.17}$ | $64.92^{+9.72}_{-5.23}$ | $0.40^{+0.15}_{-0.14}$ | $0.13^{+9.90}_{-0.13}$ |
| 0673580201 | $5.07 \times 10^{-13}$ | $3.11^{+0.18}_{-0.16}$ | $1.77^{+0.42}_{-0.38}$ | $0.50^{+2.97}_{-0.00}$ | $3.83^{+1.21}_{-0.76}$ | $80.00^{+0.00}_{-12.69}$ | $0.60^{+0.15}_{-0.14}$ | $4.25^{+2.26}_{-1.23}$ |
| 0673580301 | $2.67 \times 10^{-13}$ | $3.14^{+0.19}_{-0.12}$ | $1.46^{+0.72}_{-0.34}$ | $0.50^{+0.41}_{-0.00}$ | $5.01^{+4.99}_{-1.71}$ | $63.96^{+12.39}_{-4.38}$ | $0.64^{+0.18}_{-0.11}$ | $0.32^{+23.23}_{-0.01}$ |
| 0673580401 | $5.34 \times 10^{-13}$ | $3.14^{+0.16}_{-0.15}$ | $1.45^{+0.39}_{-0.15}$ | $0.50^{+2.91}_{-0.00}$ | $9.23^{+0.71}_{-3.67}$ | $79.07^{+0.93}_{-9.90}$ | $0.57^{+0.09}_{-0.01}$ | $2.74^{+1.35}_{-2.04}$ |
| 0780560101 | $3.75 \times 10^{-13}$ | $3.40^{+0.00}_{-0.06}$ | $2.14^{+0.22}_{-0.14}$ | $0.50^{+1.50}_{-0.00}$ | $10.00^{+0.00}_{-3.55}$ | $67.41^{+3.70}_{-2.26}$ | $0.83^{+0.03}_{-0.03}$ | $0.36^{+0.05}_{-0.05}$ |
| 0780561301 | $5.37 \times 10^{-13}$ | $3.32^{+0.07}_{-0.07}$ | $2.17^{+0.20}_{-0.13}$ | $0.50^{+0.28}_{-0.00}$ | $2.81^{+0.92}_{-0.68}$ | $75.91^{+3.31}_{-2.98}$ | $0.62^{+0.07}_{-0.04}$ | $4.60^{+2.02}_{-3.03}$ |
| 0780561401 | $6.33 \times 10^{-13}$ | $3.26^{+0.14}_{-0.15}$ | $2.03^{+0.29}_{-0.26}$ | $0.50^{+1.37}_{-0.00}$ | $3.74^{+0.98}_{-0.53}$ | $73.70^{+3.61}_{-3.12}$ | $0.65^{+0.05}_{-0.13}$ | $6.77^{+0.05}_{-0.06}$ |
| 0780561501 | $3.25 \times 10^{-13}$ | $3.36^{+0.04}_{-0.12}$ | $1.91^{+0.16}_{-0.19}$ | $0.96^{+1.71}_{-0.46}$ | $4.81^{+1.96}_{-1.31}$ | $66.95^{+6.15}_{-4.11}$ | $0.78^{+0.04}_{-0.05}$ | $288.20^{+64.3}_{-18.18}$ |
| 0780561601 | $7.61 \times 10^{-13}$ | $3.30^{+0.07}_{-0.09}$ | $2.18^{+0.21}_{-0.14}$ | $0.50^{+0.26}_{-0.00}$ | $4.01^{+2.90}_{-1.04}$ | $77.41^{+2.58}_{-2.54}$ | $0.60^{+0.07}_{-0.07}$ | $6.38^{+1.44}_{-1.57}$ |
| 0780561701 | $3.99 \times 10^{-13}$ | $3.32^{+0.08}_{-0.15}$ | $2.10^{+0.22}_{-0.31}$ | $0.50^{+2.79}_{-0.00}$ | $3.15^{+3.19}_{-0.75}$ | $70.19^{+4.91}_{-3.86}$ | $0.66^{+0.07}_{-0.15}$ | $0.03^{+3.19}_{-0.56}$ |
| 0792180101 | $3.73 \times 10^{-13}$ | $3.19^{+0.09}_{-0.13}$ | $1.92^{+0.13}_{-0.21}$ | $0.99^{+2.11}_{-0.49}$ | $5.79^{+3.44}_{-1.36}$ | $69.02^{+4.20}_{-2.33}$ | $0.76^{+0.04}_{-0.07}$ | $4.31^{+1.40}_{-2.74}$ |
| 0792180201 | $4.17 \times 10^{-13}$ | $3.30^{+0.07}_{-0.17}$ | $2.11^{+0.19}_{-0.10}$ | $0.50^{+0.22}_{-0.00}$ | $4.71^{+1.39}_{-1.19}$ | $69.15^{+2.82}_{-1.97}$ | $0.67^{+0.04}_{-0.12}$ | $4.46^{+0.68}_{-2.61}$ |
| 0792180301 | $2.48 \times 10^{-13}$ | $3.33^{+0.07}_{-0.17}$ | $1.84^{+0.54}_{-0.71}$ | $2.80^{+3.91}_{-2.30}$ | $8.89^{+1.11}_{-4.19}$ | $58.47^{+12.91}_{-9.32}$ | $0.76^{+0.08}_{-0.07}$ | $4.86^{+1.99}_{-1.97}$ |
| 0792180401 | $1.22 \times 10^{-12}$ | $3.01^{+0.04}_{-0.03}$ | $1.11^{+0.16}_{-0.08}$ | $2.35^{+0.98}_{-1.13}$ | $2.21^{+0.37}_{-0.49}$ | $79.84^{+0.16}_{-2.72}$ | $0.15^{+0.08}_{-0.09}$ | $1.50^{+6.63}_{-0.68}$ |
| 0792180501 | $3.25 \times 10^{-13}$ | $3.16^{+0.15}_{-0.16}$ | $1.43^{+0.39}_{-0.11}$ | $0.50^{+1.04}_{-0.00}$ | $4.81^{+1.96}_{-1.35}$ | $70.06^{+9.06}_{-3.77}$ | $0.49^{+0.15}_{-0.11}$ | $6.38^{+1.44}_{-1.62}$ |
| 0792180601 | $1.14 \times 10^{-12}$ | $3.30^{+0.08}_{-0.06}$ | $1.48^{+0.49}_{-0.11}$ | $2.92^{+1.63}_{-1.85}$ | $1.88^{+1.45}_{-0.84}$ | $74.39^{+2.52}_{-2.21}$ | $0.29^{+0.08}_{-0.08}$ | $2.28^{+2.76}_{-1.57}$ |

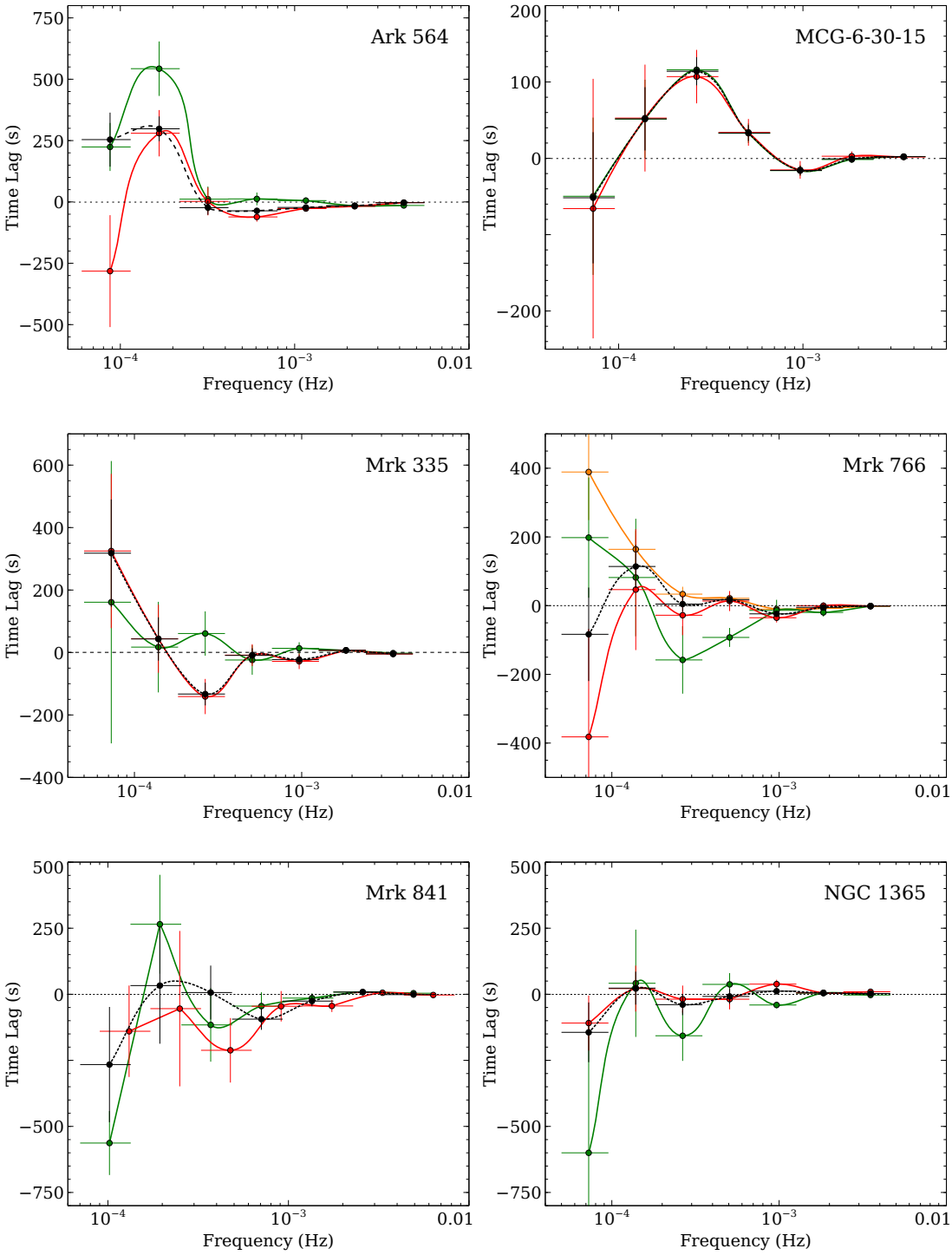


Figure 1: The lag-frequency results for all other AGN in the sample list, showing the combined lags (black dashed lines), high flux (red), medium flux (amber) and low flux lags (green).

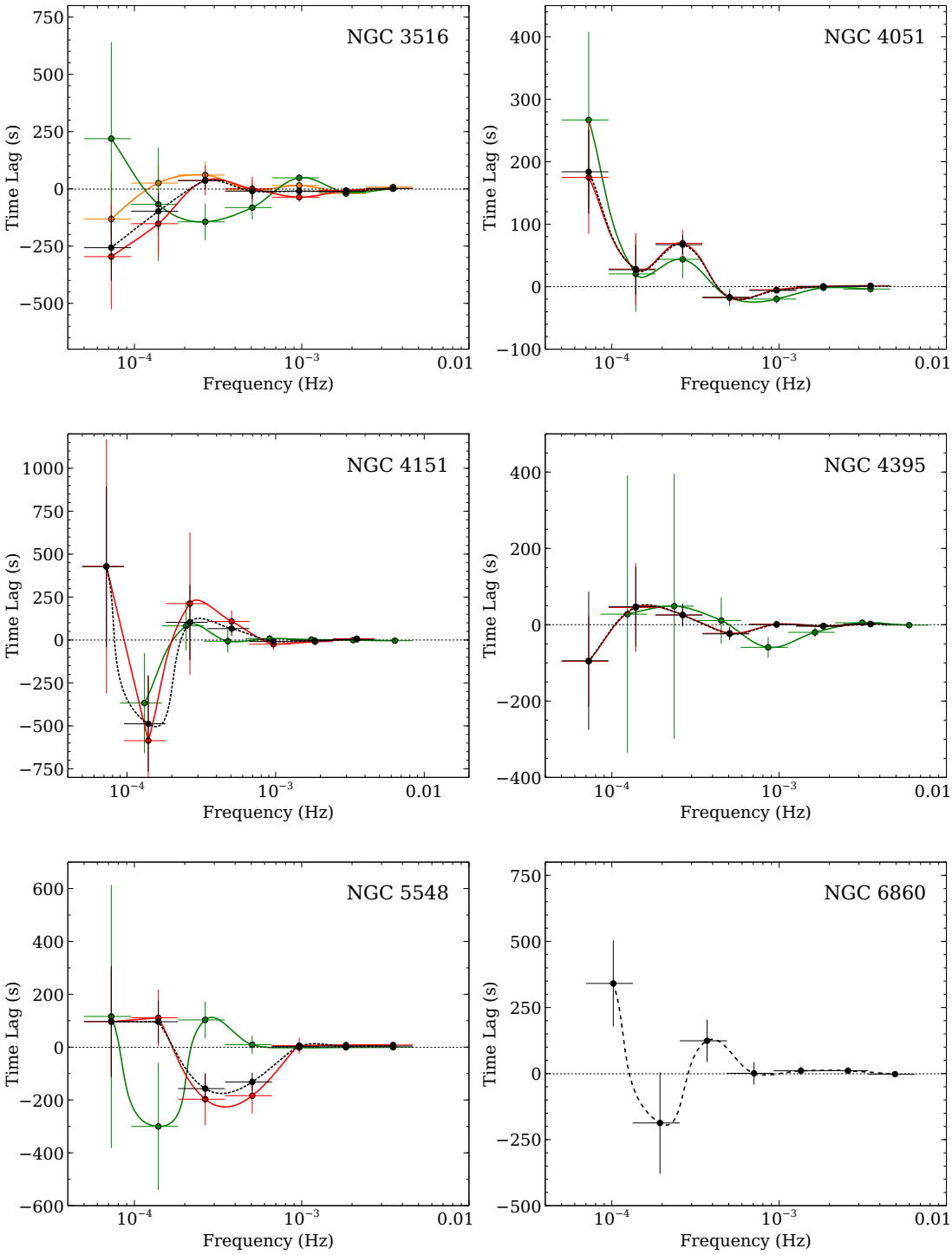


Figure 1: The lag-frequency results (continued).

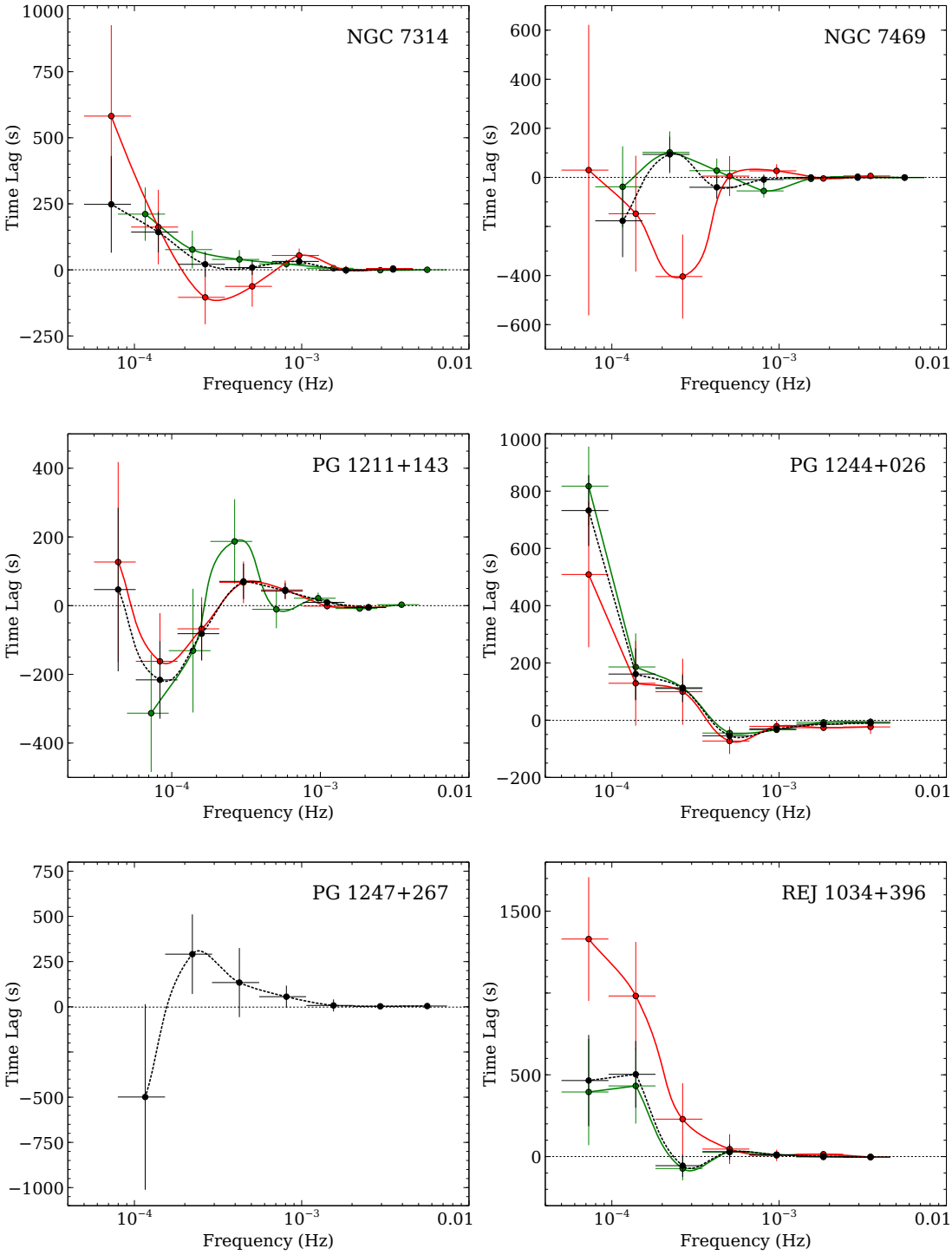


Figure 1: The lag-frequency results (continued).