

Spectral Energy Distributions of XBLs, RBLs and FSRQs

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Abstract. We have collected a sample of 86 blazars and analysed the redshift z , the accretion rate \dot{m} and the spectral index of the sample.

Key words. Galaxies: blazars—spectral index.

1. Introduction

Blazars are one of the most extreme classes of AGNs. It is important to study the radiation mechanism of blazars. The radiation of blazars is thought to be derived mostly from relativistic jets. If the radiation of the three subclasses of blazars is different, then their radiation mechanism maybe different. In order to study the radiation of XBLs, RBLs and FSRQs, we analysed the redshift, accretion rate and the spectral index of the sample.

2. Sample and data analysis

We compiled a sample of 86 blazars from the papers (Xie *et al.* 2001a, b; Xie *et al.* 2004, Yi & Xie 2008; Li *et al.* 2010, Fossati *et al.* 1998, Dai *et al.* 2007), and analysed the redshift, accretion rate and the spectral index of the three subclasses of blazars (see Fig. 1). In Fig. 1a, XBLs, RBLs and FSRQs occupy the same region, and the linear-regression equation is $\alpha_\gamma = 1.82 - 0.41\alpha_x$. In Fig. 1b, XBLs and RBLs occupy the same region, and the linear-regression equation is $\dot{m} = 0.062 - 0.038z$. FSRQs occupy another region, and the linear-regression equation is $\dot{m} = 0.069 + 0.045z$. In Fig. 1c, XBLs and RBLs also occupy the same region, and the linear-regression equation is $\alpha_\gamma = 0.345 + 0.529\alpha_0$. FSRQs occupy another region, and the linear-regression equation is $\alpha_\gamma = 1.79 - 0.42\alpha_0$. In Fig. 1d, XBLs and RBLs also occupy the same region, and the linear-regression equation is $\alpha_x = 3.40 + 1.10\alpha_0$. FSRQs occupy another region, and the linear-regression equation is $\alpha_x = 1.60 - 1.167\alpha_0$.

3. Discussions

Based on the recent grand unified theory of AGNs, one of the goals of AGN studies is to develop a unified scheme which supports that the different AGN types might be

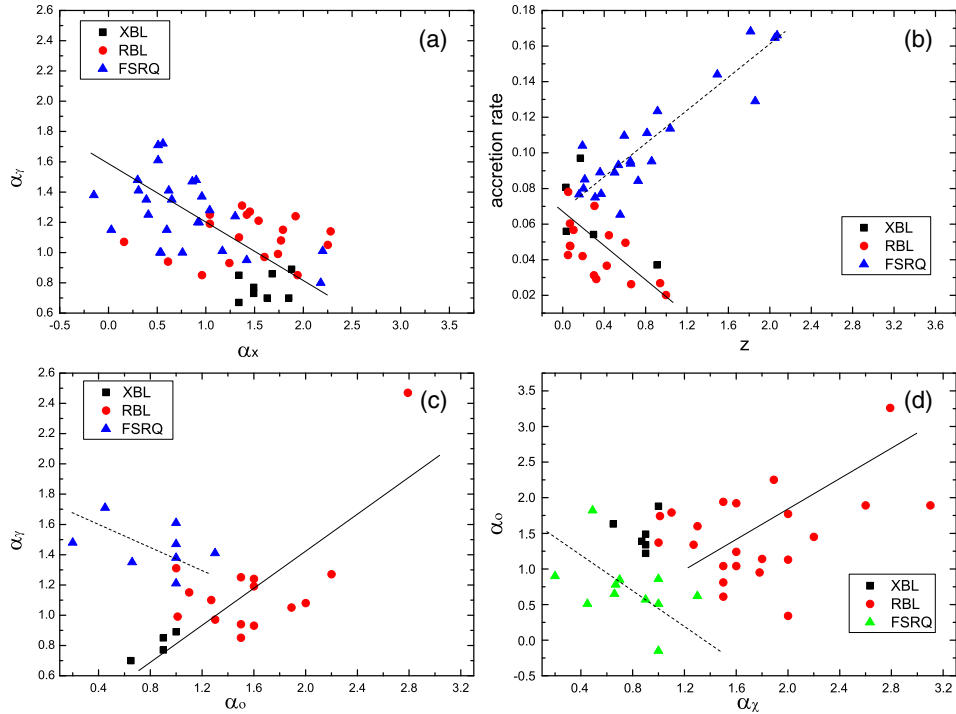


Figure 1(a–d). The relationship between the redshift z and accretion rate \dot{m} , and the relationship between the spectral index α_0 , α_x and α_γ .

due to the direction of observation for some parameters, such as the accretion rate and the spectral index. The main conclusion of this work is that despite differences in $z - \dot{m}$, $\alpha_0 - \alpha_\gamma$ and $\alpha_x - \alpha_0$ diagrams of the three subclasses of blazars, the unified scheme is possibly accepted, which is hinted in the $\alpha_x - \alpha_\gamma$ diagram (Fig. 1a). The difference in $z - \dot{m}$, $\alpha_0 - \alpha_\gamma$ and $\alpha_x - \alpha_0$ diagrams (Fig. 1(b)–(d)) may be caused by different emission mechanisms of BL Lacs and FSRQs emissions.

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