

Cloud-to Ground Lightning Flash Characteristics in Southeastern Brazil in the Winter Season

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The lightning flash characteristics in the southeastern region of Brazil were obtained in the winter season of 1993 through a lightning positioning and tracking system (LPATS). The preliminary data are presented in terms of polarity, multiplicity, and peak current of the first-order stroke. The results are compared with similar data obtained in the same region in the summer season.

INTRODUCTION

The lightning activity in the winter is known to be lower than that in the summer season (Pinto and Pinto, 1996). Lightning results during winter have been published for several authors (e.g. Brook et al., 1982; Orville et al., 1987; Orville, 1994).

In this paper the first results about the lightning characteristics of winter flashes in the southeastern region of Brazil are presented, in terms of polarity, multiplicity and first-order stroke peak current. About 70,000 lightning flashes were recorded during the months of August and September of 1993 in the state of Minas Gerais. The lightning data were obtained by a lightning positioning and tracking system (LPATS) operated by the Companhia Energética de Minas Gerais (CEMIG). The results are compared with similar data obtained in the summer season of 1993 (Pinto et al., 1996; Gin, 1996).

RESULTS

The figures below show the characteristics of lightning flashes in terms of polarity, negative and positive multiplicity, and negative and positive first-order stroke peak current. No results are presented for bipolar flashes due to its low percentage of occurrence.

DISCUSSION AND CONCLUSIONS

The comparison between the data shown in figures above with similar data obtained in the summer season in the same year and same region indicates that:

- the lightning distribution in terms of polarity is almost the same in both seasons;
- the average multiplicity of negative multiples flashes in the winter (2.7) is slightly lower than in the summer (2.9);
- the percentage of single stroke flashes in the winter (66.8) is higher than that in the summer (59.5);
- the average multiplicity of positive multiple flashes is the same in both seasons;

- the negative and positive flashes in the winter showed average first-order stroke peak current of 29 kA and 19 kA, respectively. These values are lower than those obtained in the summer (42 kA and 22 kA, respectively), mainly in the case of negative flashes.

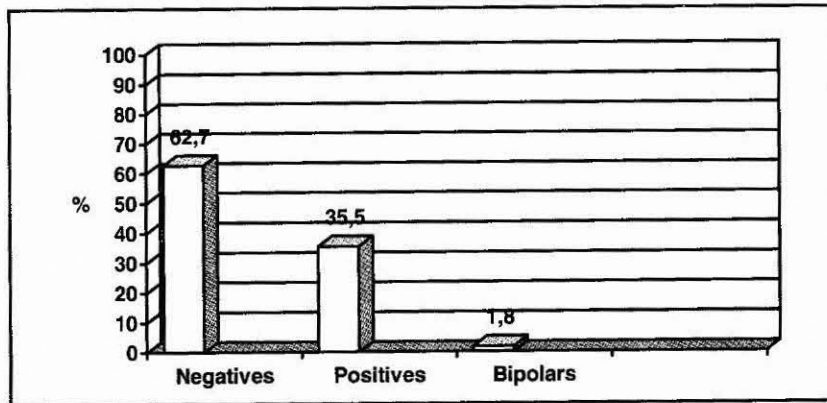
ACKNOWLEDGMENTS

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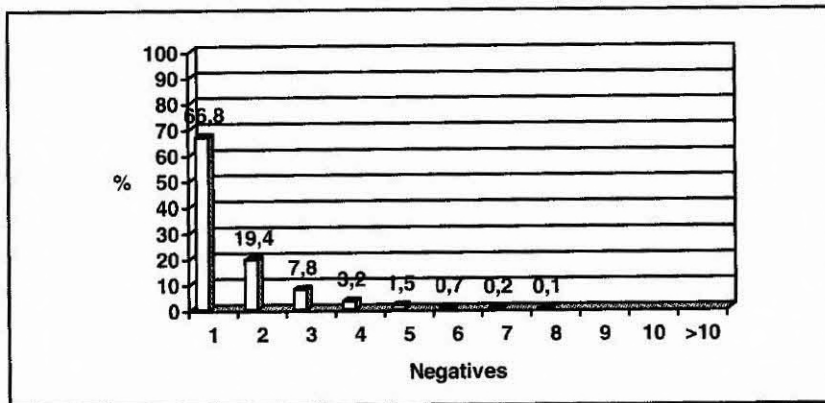
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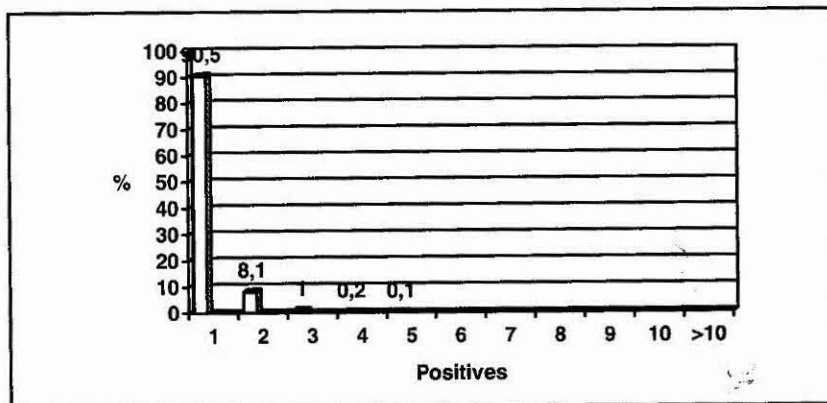
Polarity



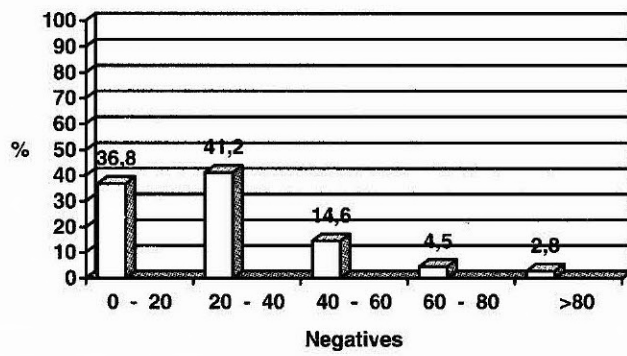
Multiplicity



Multiplicity



First-order stroke peak current



First-order stroke peak current

