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Seasonal and diurnal variations in lightning over Southern Africa and the effect of warm ocean currents

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An analysis of lightning flash data over a seven year period shows that the annual variation in the lightning flash rate (R) is sinusoidal and described by

R= A+Bcos2Íï(Day-41)/365

where A and B depend on location. For a well studied region on the East Coast of South Africa A= 3.2x10^4 day $^{-1}$and B=2.0x10^4 day^{-1}. A significant feature of the observations is that there is an almost constant contribution to R from a region associated with the warm Agulhas current off the East coast and this is represented by A-B.

Flash rates are a maximum close to the equator (107 km^{-2} year^{-1} but maxima are also found in mountainous regions of South Africa (26 km^{-2} year^{-1}) and Madagascar (32 km^{-2} year^{-1}).