Describing the eletrical nature of the Amazon thunderstorms during the 2ond GO-Amazon IOP and ACRIDICON-CHUVA field campaign.

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During the Second IOP of the GO-Amazon and ACRIDICON-CHUVA field campaigns, September of 2014, we deployed several lightning sensors to characterize the Amazon thunderstorms, that englobe a field mill network around the T3 site and the LINET and STARNET lightning detection networks to capture both IC/CG and CG lightning respectively.
To complement those observations we have used the vertical pointing cloud radar from ARM site, the micro rain radar (MRR) and the XPOL radar from CHUVA to characterize the vertical precipitation structure of those thunderstorms.

On September 8th 2014, a thunderstorm crossed the ARM site T3 and produced more than 3,000 CG and more than 5,000 IC lightning.
The vertical electrical field (Ez) was above (+-) 2 kV/m during the thunderstorm activity and reached as high as -9 kV/m.
The Ez temporal evolution showed a classical end of storm oscillation with the first part of the rain producing negative Ez and after the maximum lightning activity having positive Ez. Into this respect the precipitation was carrying positive charges initially and negative charges afterward. The lightning rate varied from 2-7 strokes/second and during the maximum activity it reached 25 flashes per second. The IC lightning activity was concentrated mainly at 10 and 15 km with a second center between 5-9 km height.

The cloud radar showed cloud development as high as 12-14 km with -10 and 10 dBZ, while MRR had radar reflectivity values above 50 dBZ during the maximum lightning activity. The XPOL showed development above 14 km, but due to the rain the attenuation decrease its sensitivity.