

## **The Early Years of HF radar studies of the ionosphere**

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The first radar studies of the ionosphere at HF frequencies were performed in the equatorial electrojet in the early 1970s. They were aimed at studying the long wavelength characteristics of the two-stream and gradient-drift plasma instabilities discovered with VHF radars at Jicamarca. A joint observation campaign was organized in Chad by US and French groups at the occasion of the June 1973 solar eclipse.

With the development of the EISCAT incoherent scatter radar, the French solar-terrestrial physics scientific community was motivated to install associated instruments in Scandinavia. From 1978, LSEET developed, in cooperation with IRF in Uppsala, the SAFARI (Swedish And French Auroral Radar Investigations) radars, located in Lycksele and later in Oulu. It was a natural complement, at HF frequencies, to the STARE system developed at Max Planck Institute für Aeronomie.

The paper presents Jean-Paul's involvement in this program and the most important scientific results obtained with the SAFARI radar, among them the first Doppler observations of high-latitude F-region irregularities, the comparison of the F-region phase velocity with the electron drift velocity, and joint radar and satellite studies of the plasma mechanisms at the origin of the irregularities.