COSMIC RAY RADIODETECTION

A NenuFAR-CODALEMA joint venture ?

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OUTLOOK

Witra-High Energy Cosmic Rays

- ✓ Involves astrophysics & particle physics
- ✓ Community → needs for a new instrument
- ✓ Augmentation of statistics, discrimination of composition, energy resolution

Radio detection of cosmic rays

- ✓ Key method for the future ?
 - French competence great opportunity !
 - CODALEMA and Nançay (includes LOFAR and NenuFAR) as a development base
- ✓ AERA : multi-hybrid on Auger pertinence of the method, R&D difficult on site
- ✓ Still to find the composition-related radio observable
- ✓ A new way to observe very fast transients: potential new window in radioastronomy ?

Links with LOFAR and SKA

- ✓ High sensor (antenna) density: very fine shower profile
- ✓ Ability to discriminate showers on radio signal only (aim of compact array @ CODALEMA)
- ✓ From compact array to NenuFAR: see discussion tomorrow...





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CODALEMA AND NENUFAR



IT COULD HELP... PROFILE



IT COULD HELP... POLARIZATION









IT COULD HELP...

Rejection of noise events AND/OR selection of good events





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WHY ?

Cluster triggering for improvement of selectivity (depends on results of current CODALEMA compact array)

- Phased antennas Improvement of sensitivity (large distance detection if externally triggered)
- Sum Series State Series Se

OPTIONS - I

Isolate 1 antenna in each mini array, external trigger





Powerful, but dedicated operation

OPTIONS - 3

Use one of the mini arrays as composite trigger for the others, not externally triggered



Is it possible ? also depends on current CODALEMA compact array results, but would be completely autonomous !

OPTIONS - 4 and more...

Any other idea ?

