"Full Beam" Self-Calibration

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- What is "Full-Beam" VLBI Self-calibration ?

- Relies on a few "likely" conditions:

  - Sky is not empty – there are other sources in the Field of View (+ target!),

  - VLBI has recently achieved sensitivity levels such that all compact objects > 100 microJy can be detected with Gbps data rates in 24 hr integrations

  - Wide-field techniques permit many sources in the FoV to be detected *simultaneously*.

EVN Sky

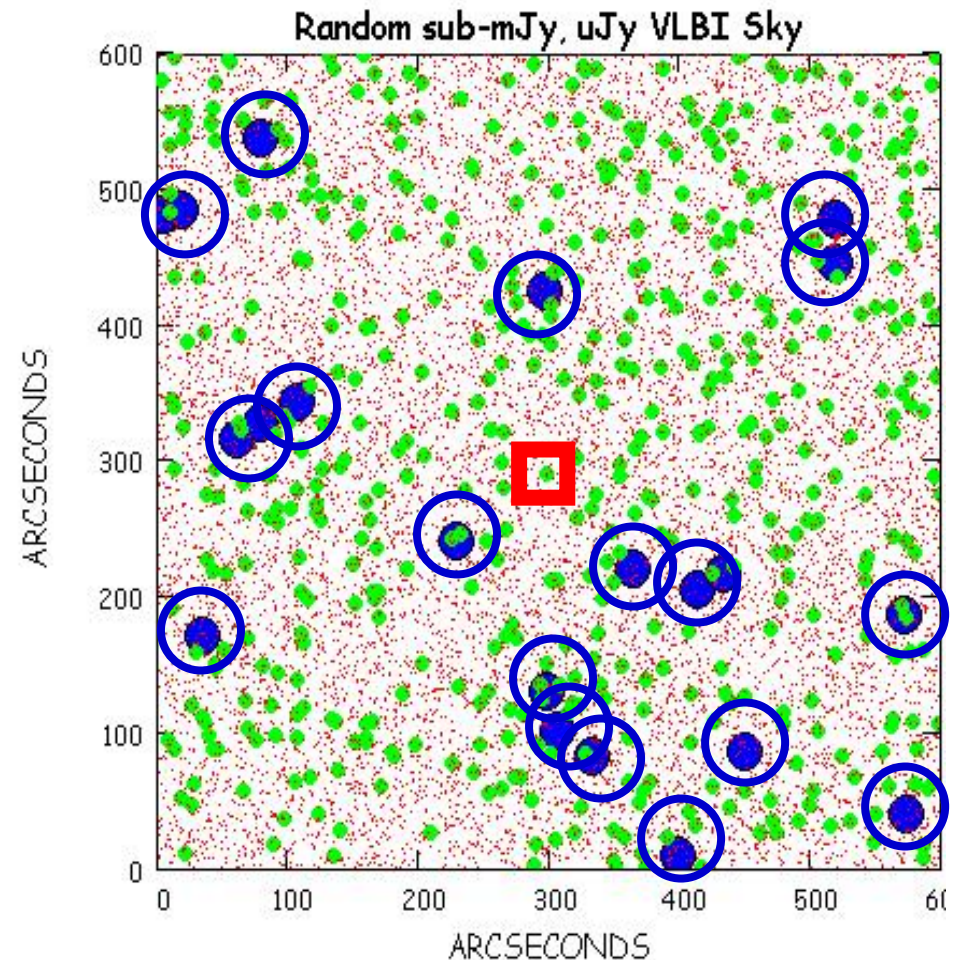- Many hundred potential targets in EVN field-of-view.

Figure (right):

Blue = > 100uJy
Green = 10-100 uJy
Red = 1-10 uJy (e-EVN)

- External Phase Ref/Wide Field Imaging detects target and other sources simultaneously.

- The **combined response** of all sources in the beam permits self-cal of target field (full-beam self-cal).

Random sub-mJy, uJy VLBI Sky

An Example: NOAO-N (Bootes) Deep Field

- NOAO-N VLBA+GBT reaches 9 uJy/beam - *Garrett, Wrobel & Morganti, ApJ 2004.*

  - 61 sub-mJy & mJy sources targeted, 9 detected.

  - 29% of mJy sources (see also Porcas et al.).

  - 8% of sub-mJy sources detected.

  - See poster by Orienti et al.

  - Feasibility of Full-beam VLBI self-calibration demonstrated (see paper).