Low-frequency radio polarimetry reveals a sky full of filamentary polarized structure, including narrow depolarization canals that appear as elongated minima in polarized intensity. Their physical origin is still not fully understood. In particular, it remains unclear why they appear as such long and narrow structures in low-frequency interferometric maps. In this presentation, I will present to what extent this morphology is shaped by the instrumental transfer function, especially by the loss of large angular scales caused by missing short spacings.

To achieve this, I will present a synthetic study of this effect using MHD-based synchrotron cubes and LOFAR-like mock observations. I apply controlled Fourier-space filtering to Stokes Q, and U, reconstruct the maximum polarized intensity, and then quantify how the filtered maps change both spectrally and morphologically. I will show that spatial filtering suppresses the smooth large-scale background, shifts power toward higher spatial frequencies, and can produce a bump in the Pmax power spectrum only in some filtering regimes. I will also show that filtering breaks broad depolarized regions into more numerous and thinner canal-like structures, increases their multiplicity across the field, and keeps their preferred orientation tied to the magnetic field projected on the plane of the sky.

These results show that narrow depolarization canals do not necessarily trace narrow physical structures in the gas. In low-frequency interferometric maps, they can be the filtered imprint of broader depolarized regions shaped jointly by the projected magnetic field and the instrumental response.