Extragalactic wide-field surveys using the European VLBI Network

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In this talk, I will present current result from the largest and most intensive wide-field VLBI project ever undertaken with the European VLBI Network which targets the highly studied GOODS-N field. This talk will be split into two parts:

Part 1 will outline the technical progress developed over the project, namely direction-dependent calibration (Radcliffe+16, Moldon, Radcliffe+in prep.), and a new primary beam correction scheme for the highly heterogeneous EVN (Keimpema & Radcliffe+in prep., Radcliffe+18a) both of which are now publicly available.

Part 2 will outline the first results of this VLBI survey, revealing 31 faint radio sources, across 0.5 square degrees, down to uJy flux densities (Radcliffe+18a). We will illustrate that we may be detecting hints of a new population of core-dominated radio sources (see also Herrera-Ruiz+17,18) which required by empirical simulations (Whittam+17), and are also observed in low-luminosity objects in the local universe (Baldi+18). In addition, we hope to present the first results using the EVN-eMERLIN hybrid array which can, for the first time, probe the interplay between nuclear starburst and AGN activity by being simultaneously sensitive to kpc and sub-kpc scales at z>0.2. VLBI need not just be a simple extragalactic 'AGN finder' anymore.