



# EUREF IE/UK 2009 EUREF Densification Campaign

Geoff Bell

Land & Property Services Geodetic Manager

Mark Greaves

Ordnance Survey Geodetic Analyst

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# Motivation

## In GB

- Previous campaign - EUREF GB 2001, 50% stations now gone
- New, zero order, “GeoNet” network recently completed

## In Ireland / Northern Ireland

- Previous campaign - EUREF EIR/GB 95 passive network
- Active stations coordinated in 2002 but not submitted to EUREF

A homogenous EUREF densification across the whole region  
would benefit all parties

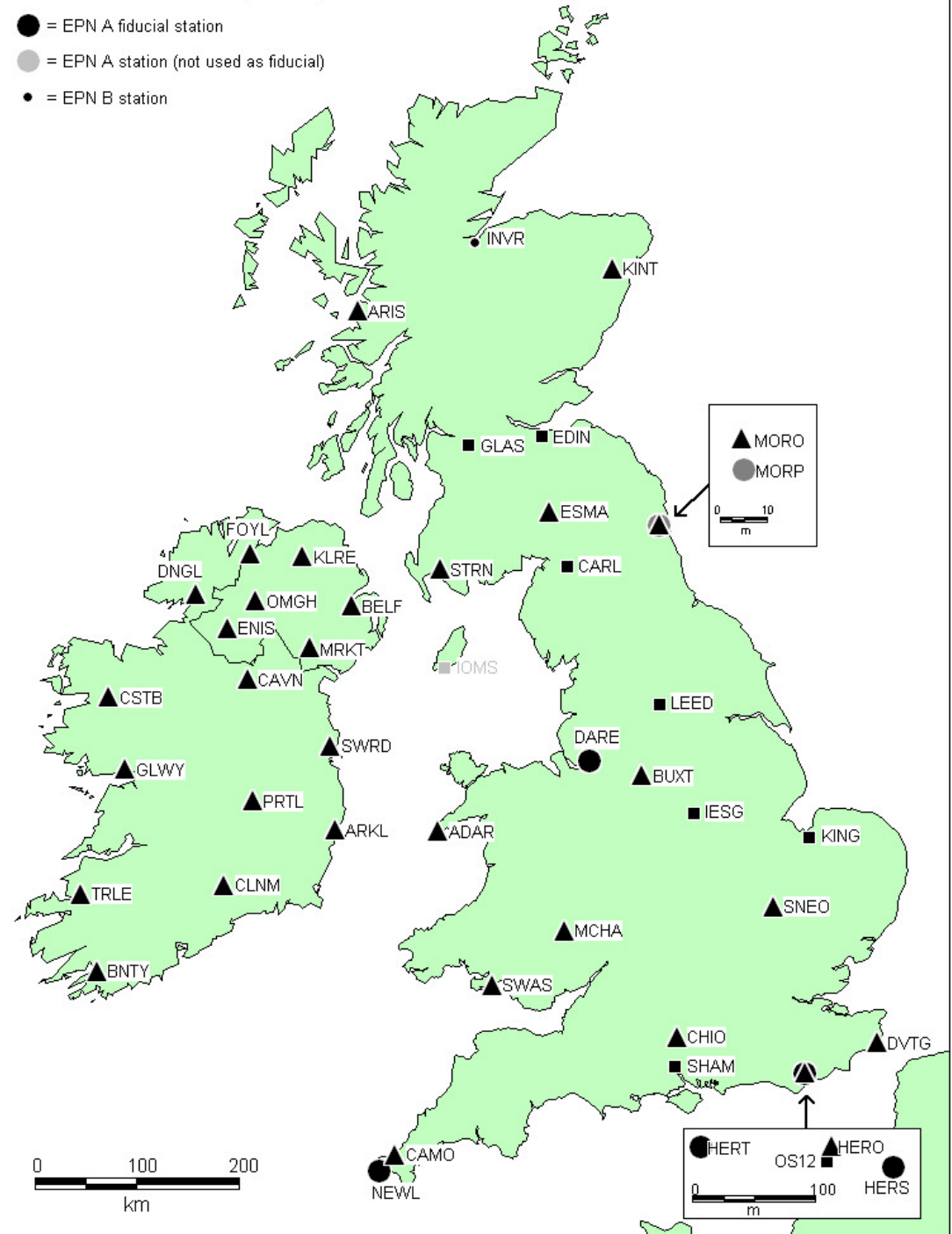
# GeoNet

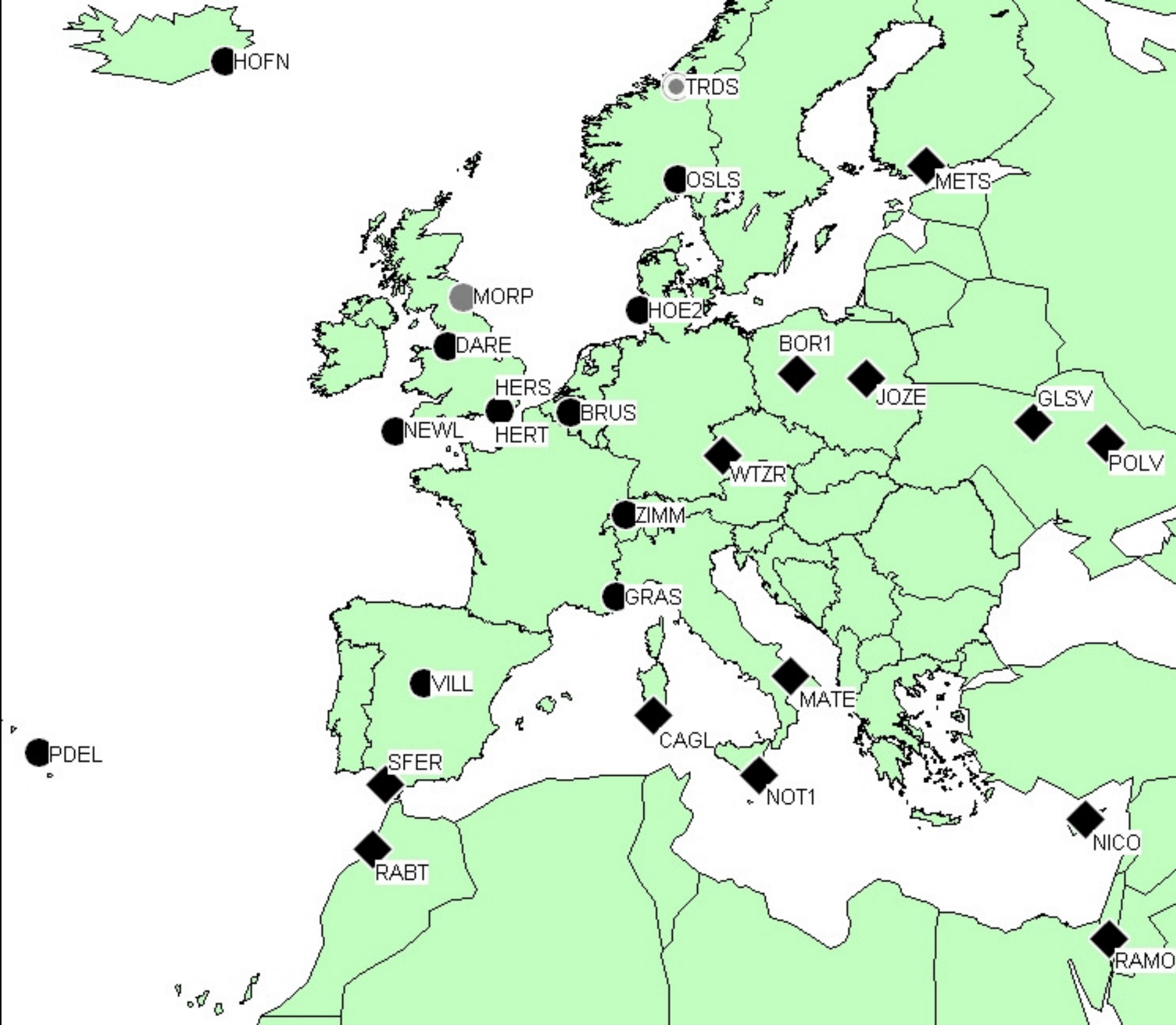




# EUREF IE/UK 2009 network

- ▲ = EUREF IE/UK 2009 station
- = EUREF GB 2001 station
- = EUREF GB 2001 station (not used)
- = EPN A fiducial station
- = EPN A station (not used as fiducial)
- = EPN B station





# Data processing

2 weeks of data, September / October 2009

Bernese software v5, EUREF densification and LAC guidelines

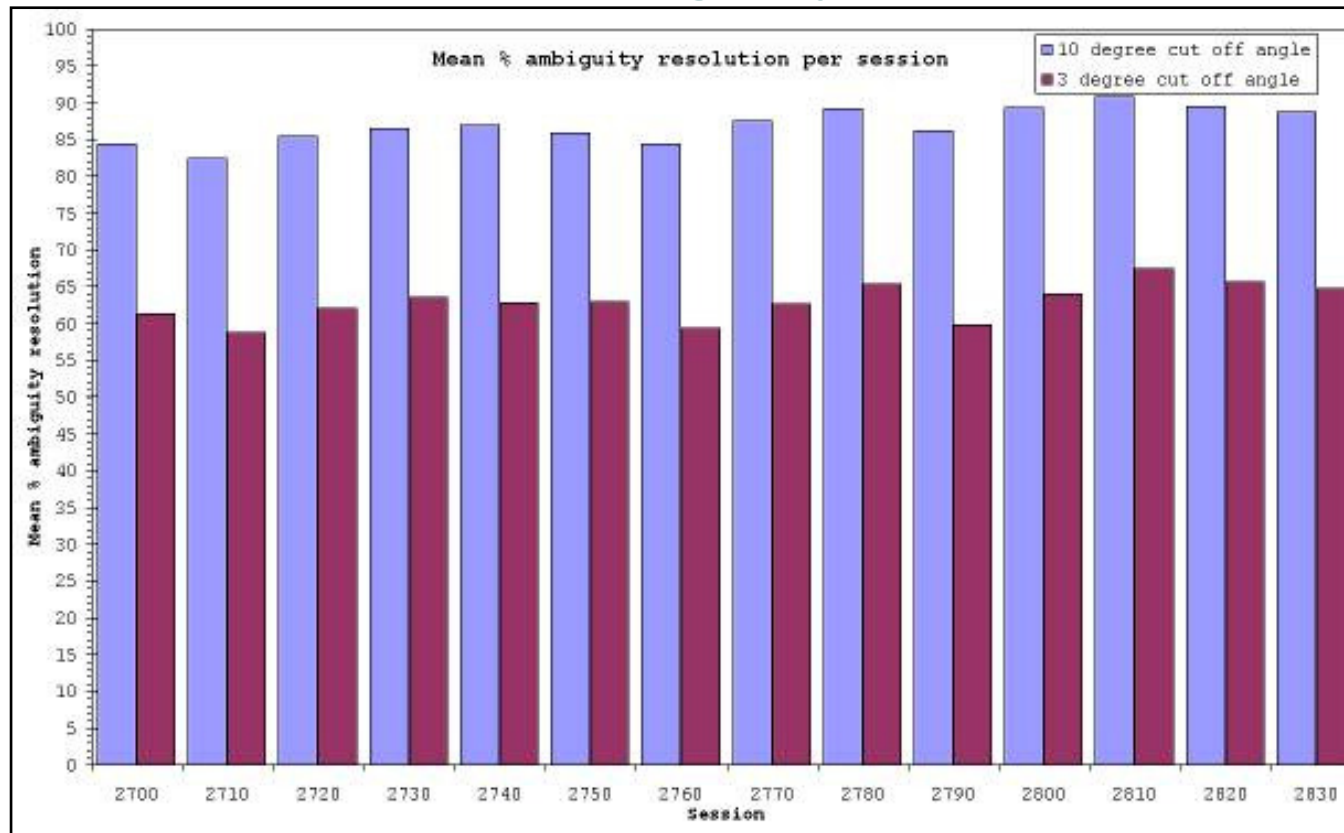
- Absolute calibrations for all antennas
- 3° elevation cut off
- QIF ambiguity resolution
- Hourly troposphere
- EPN weekly SINEX solutions added
- ITRF2005 realised through minimal constraint conditions

Different elevation cut offs in ambiguity resolution compared

Different minimal constraint conditions compared

Independent solution check with Nottingham University

# Results #1 – Ambiguity resolution



Lower angle = lower % resolved

NUMBER of ambiguities resolved very similar

NEU RMS coordinate difference =0.3mm so 3° used throughout

## Results #2 – Daily coordinate repeatabilities

RMS repeatabilities from all LACs analysed to determine RMS outlier rejection levels of 3mm for NE and 9mm for U

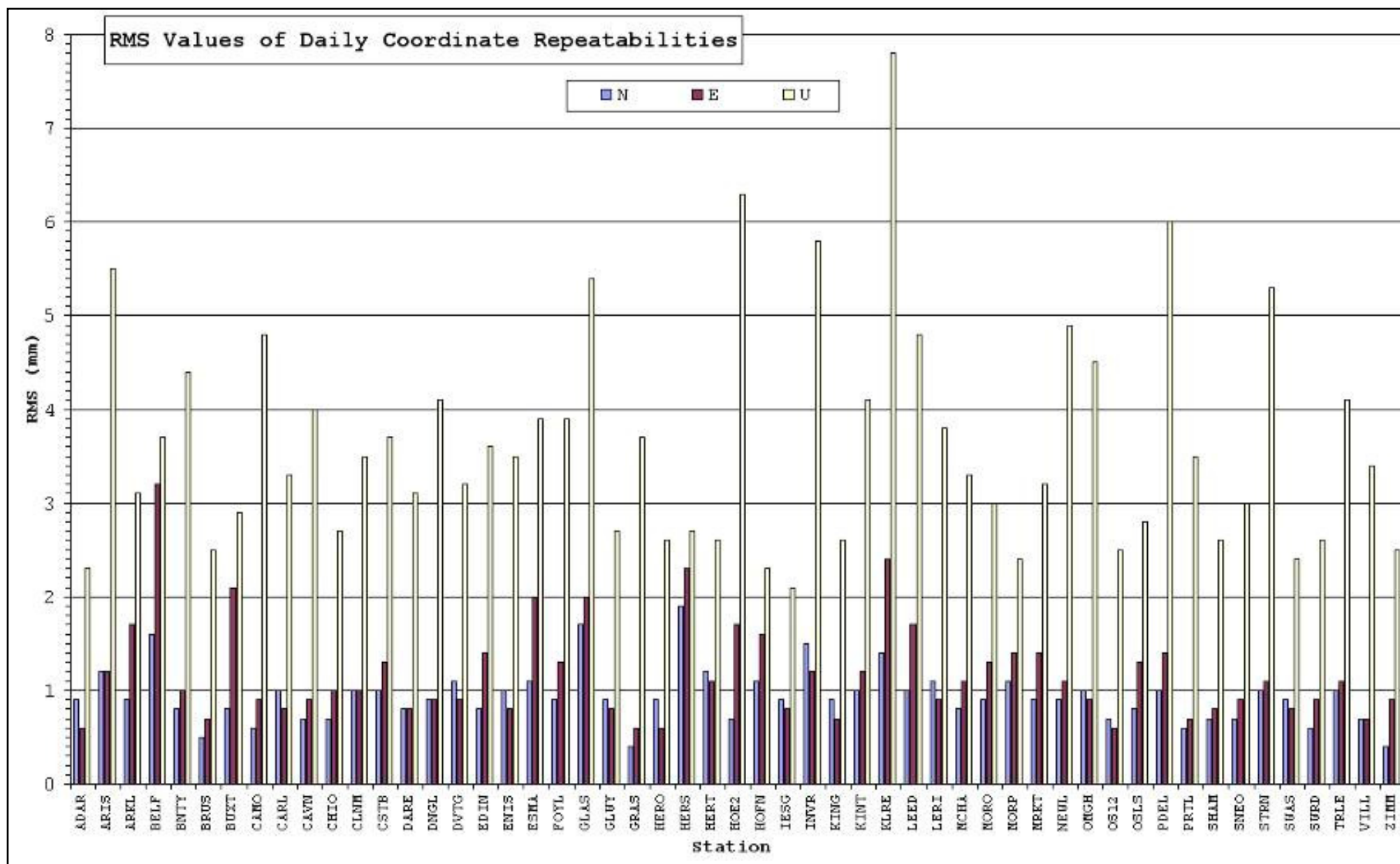
TRDS:

- Poor performance on 3 days
- Still poor after removal of 3 days so station eliminated
- No obvious reason for poor performance

Final, daily coordinate repeatabilities = 1-2mm NE, 3-5mm U



## Results #2 – Daily coordinate repeatabilities

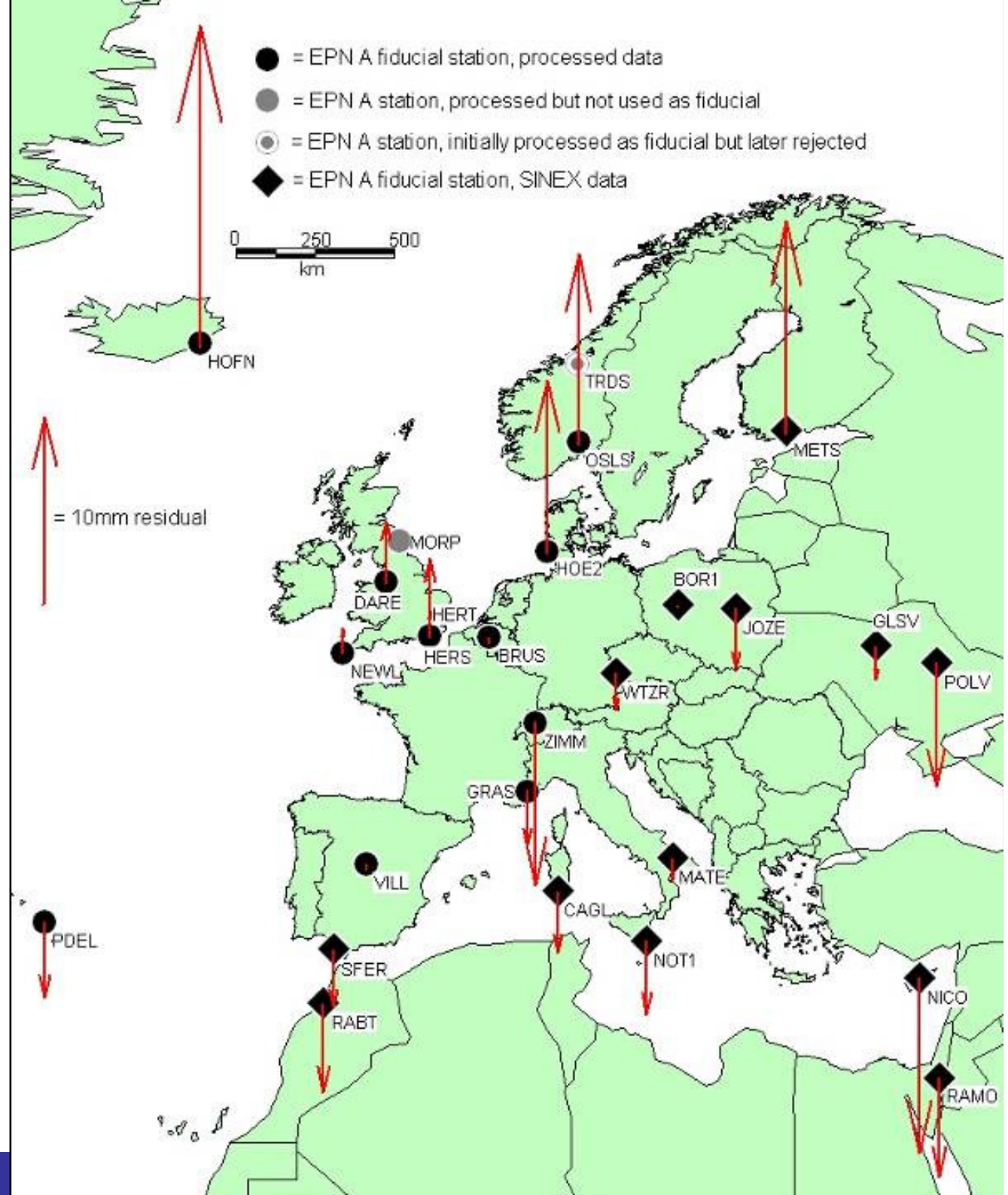


## Results #3 – Fiducial coordinate recovery

Fiducial coordinate recoveries show ITRF2005 realised to around 2mm in NE and around 6mm in U.

Some outer stations at 10mm level in U with (HOFN) at 17mm.

# Fiducial station U recovery



## Results #4 – External check and ETRS89 comparison

Close agreement with Nottingham University solution:

- NEU RMS coordinate differences (mm) = 0.5, 0.3, 1.7
- mean NEU coordinate differences (mm) = -0.1, -0.2, -0.8

Comparison to ETRS89:

- For GB comparison with ETRF97 at 10mm level
- Comparison with ETRF2000 at 25mm level
- For Northern Ireland comparison with ETRF2000 at 10mm level

Thank You