Underestimate of offshore blowing winds

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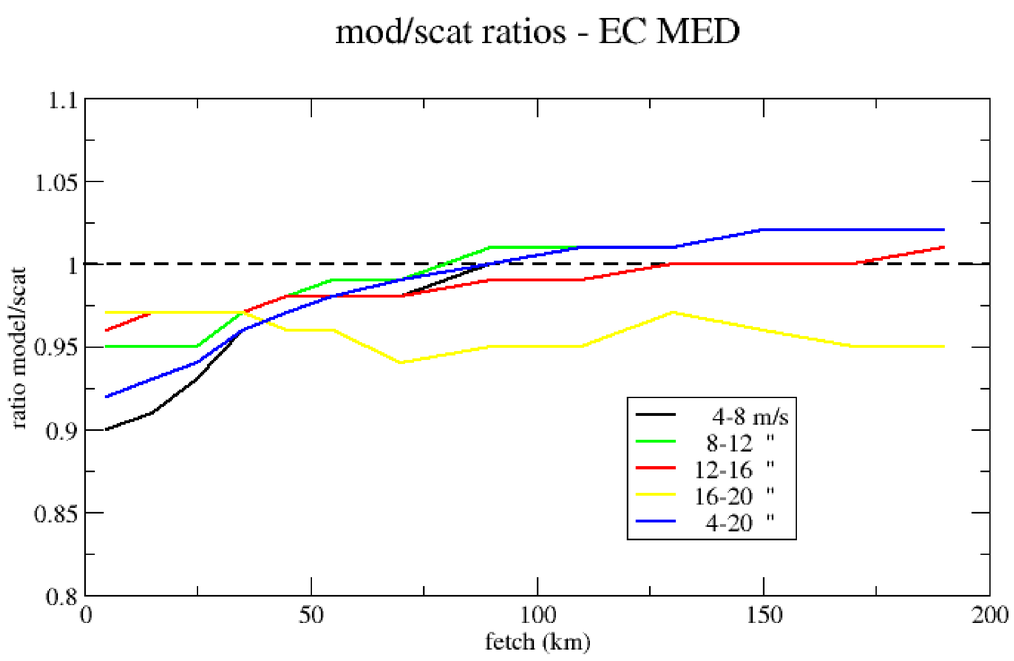
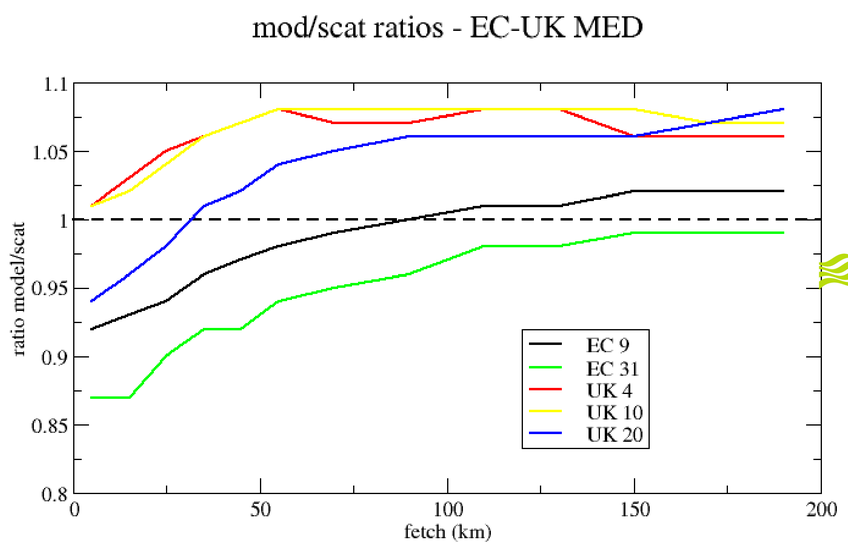
1) ISMAR-CNR, 2) ECMWF, 3) UKMO, 4) JMO

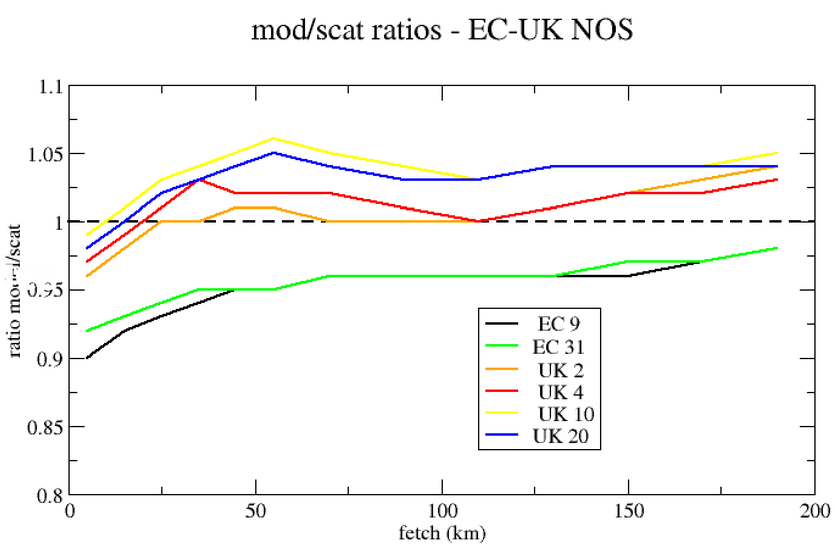
Problem: ECMWF winds are underestimated in enclosed seas, the more so the smaller the basin (e.g., -12% on the Adriatic Sea)
Reason: extended underestimate when winds is blowing from land to offshore

1st Picture of the situation: Select the scatterometer data close to coast (<200km) when wind is blowing to offshore and compare with model U_{neu}. This is done for different ranges (4-8-12-16-20 ms^{-1}) of the scat wind speed

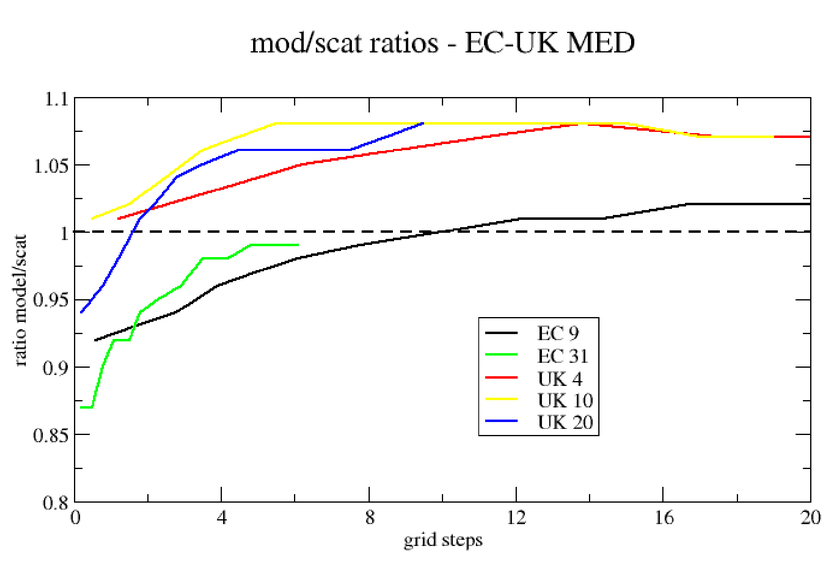


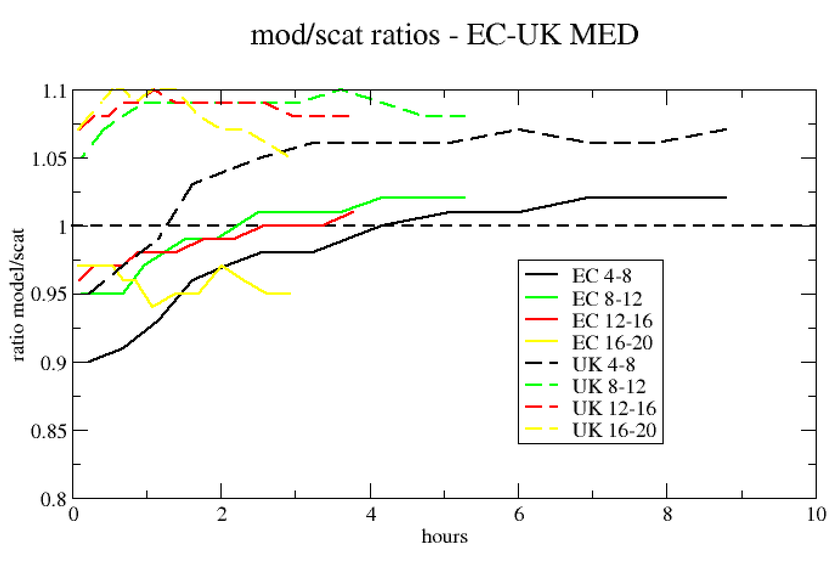
2nd Picture of the situation: Considering the overall results, we plot them according to model resolution, ECMWF or UKMO, Mediterranean or North Sea





3rd Picture of the situation: The above results are shown as a function of the distance from coast – now we plot them as a function of: (left) the number of grid steps (resolution dependent), (right) the time (hours) the wind has been running over the sea





The ECMWF underestimate turns out to be orography dependent: the coarser the profile of the last 200 km before the wind enters the sea, the stronger the coastal underestimate.