

## ***Interactive comment on “Enhancing the spatio-temporal features of polar mesosphere summer echoes using coherent MIMO and radar imaging at MAARSY” by Juan Miguel Urco et al.***

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We would like to thank the reviewer for his useful and positive comments. We will address them in detail in the final version. Here we would like to comment on a couple of them:

1. "By inspecting Figures 3-6, the improvement from SIMO to MIMO is significantly smaller than that between Capon and MaxEnt. Can the authors comment on it?"

The expected improvement from SIMO to MIMO is about 50% due to the resulting antenna configuration by using MIMO. See Fig. 1. It could be further improved by

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using a longer separation between the transmitting antennas but we are limited to the currently installed antenna array. This improvement can be quantitatively verified in Table 2 for a point-like target.

As described in P.7 line 1, the Capon performance is strongly affected by the increase in the number of targets. For the two events showed in this paper the illuminated area is full-filled with PMSE, so a poor performance is expected when Capon is used. However, we still expect an improvement of  $\sim 50\%$  from SIMO-Capon to MIMO-Capon. In the case of MaxEnt, the algorithm is limited by the amount of information contained in the image (Entropy), i. e., changes in the image.

2. "The small features drifting with winds in event 1 seem like so-called ripples from gravity wave breaking. Ripples often show up in airglow and PMCs."

We agree that the description of ripples fit with our observations (Event 1). We will modify our text accordingly, including the suggested reference.

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