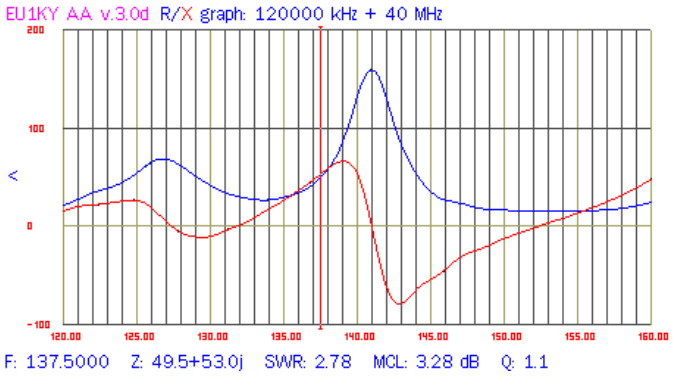

Fig. 8. The impedance components R,X measured for the inductive (long) dipole.

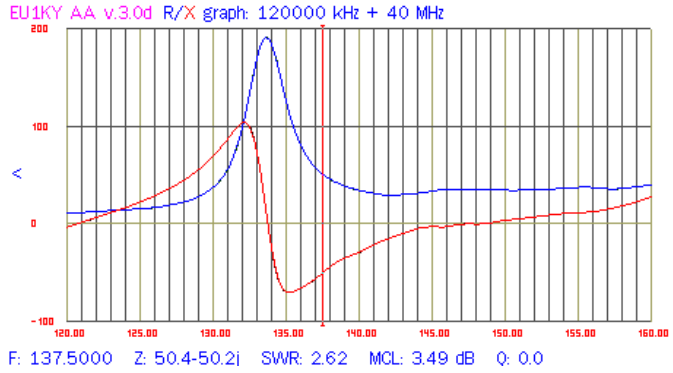

Fig. 9. The impedance components R,X measured for the capacitive (short) dipole.

After fitting the two dipoles in parallel, the total impedance of the obtained radiant system was measured (Fig. 10), on the 137.5MHz central frequency of interest, its value being Z=53.5-j0.6. The standing wave ratio measured on the central frequency is SWR=1.07. The bandwidth obtained for a standing wave ratio of 1:1.5 is ~26MHz (128.4-154.6MHz).

These impedance measurements were performed indoors, in an enclosure not treated in terms of the radio frequency field, with dimensions in all directions of about 3λ, the presence of adjacent structures presumably influencing the obtained results.

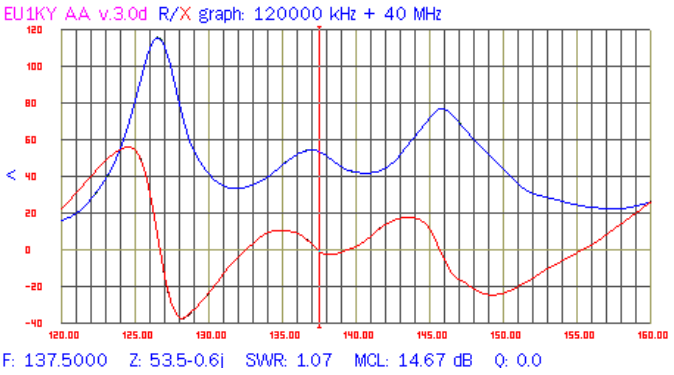

Fig. 10. The complex conjugate impedance antenna measured impedance components R,X.

V. CONCLUSIONS

The experimental results confirm the validity of the concept and the dimensional values obtained by simulation.

Among the advantages, worth to mention that this antenna has the input characteristic impedance of 50Ω, being easy to feed with usual coaxial cables through a common mode choke balun (**bal**anced-**un**balanced). The radiation pattern is omnidirectional and has axial circular polarization, obtained by design without an additional phase shifting circuit. It has a simple mechanical structure with only few electrical contacts and makes use of a single central antenna mast (e.g. UV resistant PVC pipe) that houses the coaxial cable, the choke balun and protects the connectors from the elements.

This antenna can be used as well for the radio meteor detection receiving stations, provided that the gain is high enough to cover the required link budget.

Outdoor impedance and SWR measurements, as well as radiation pattern measurements of the test antenna, using LEO (Low Earth Orbit) artificial satellites as reference radiofrequency sources, are in view. A full scale antenna prototype is intended to be used, in a first step, for meteor scatter and Es (Sporadic E) communications in the 50MHz frequency band.

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