











TABLE IV. PARAMETERS OF THE THREE QUARTER WAVELENGTH VERTICAL POLARIZED DIRECTIVE ANTENNA WITH TWO RADIALS

Main lobe elevation angle [°]	HPBW [°]		Ga [dBi]	F/B [dB]	Z [Ω]	SWR	BW@SWR 1:1.5 [MHz]
	H	V					
43.1	126	35	8.4	14,86	50	1:1	1.0

The three quarter wavelength vertical polarized directive antenna with three elements has a comparable radiation pattern as a three element horizontal polarized Yagi-Uda antenna. The compared total far field radiation patterns in the horizontal and the vertical planes of a three quarter wavelength vertical polarized directive antenna installed near the ground and of a horizontal polarized Yagi-Uda antenna with the radiator at a quarter wavelength AGL and the boom tilted at 30° above the horizon are shown in Fig. 17. In the horizontal plane, the radiation patterns are nearly identical, whereas in the vertical plane the Yagi-Uda antenna behaves better at high elevation angles. The disadvantage of using vertical polarization over horizontal resides in the fact of being more susceptible to artificial local interferences which are mostly vertical polarized.

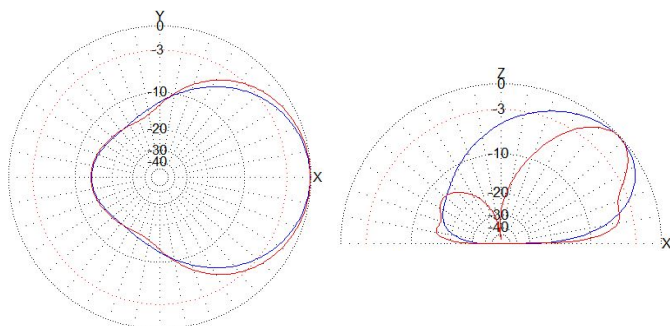


Fig. 17. Compared far field radiation patterns in the horizontal and vertical planes: three elements 3/4 vertical polarized directive antenna (red), three elements horizontal polarized Yagi-Uda antenna (blue).

## V. CONCLUSIONS

Based on the three quarter wavelength vertical antenna study, a new type of a directive vertical polarized antenna with the main lobe at medium elevation angles was proposed. Two designs, using one respectively two radial elements, were simulated and optimized. This type of antenna is base fed, it has low characteristic impedance and it has a low wind load. Thus, they are easy to build, allowing light structures to be used as antenna poles. For impedance matching, they do not require additional components and can be directly fed with common coaxial transmission lines, through a common mode choke. The optimizations were carried out for 50 Ω impedance, but by tilting the radial elements they can be easily matched to a 75 Ω impedance.

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