

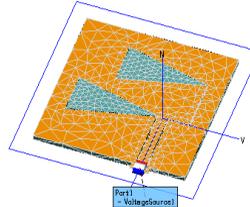
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MOTIVATION

- ◆ The goal of this work was the design of a broadband antenna integrated into a composite skin.
- ◆ The bow-tie slot antenna is a broadband design used in many communication applications.
- ◆ In order to have an even broader bandwidth, a novel bandwidth-enhanced bowtie slot antenna fed by a coplanar waveguide (CPW) is proposed

ANTENNA STRUCTURE



The modified antenna structure is obtained through the insertion of a 180 degree delay slot line between the feeding CPW and one of the two parts of the bow-tie.

SUBSTRATE SETTING: THREE LAYERS

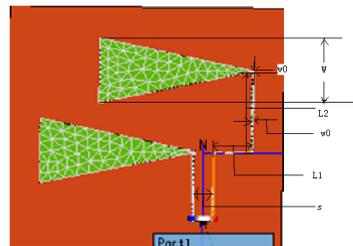
Layer	Permittivity	Loss Factor	Thickness
1	4.5	0.005	0.257cm
2	9.6	0.0009	1.5cm
3	4.5	0.005	1.5cm

- ◆ This layout is fixed by other, composite engineering considerations.
- ◆ The first decision that must be made is where the antenna should be placed.

TRANSMISSION RATES

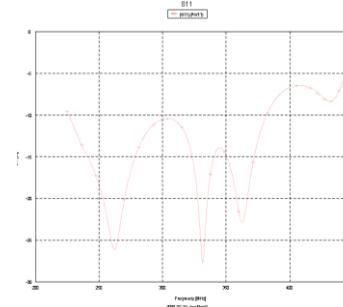
- ◆ The mismatch (permittivity 1/ permittivity 2) gets larger, the transmission rates reduced.
- ◆ The resulting surface waves not only do not radiate, but can actually interfere with other equipment integrated into the skin.
- ◆ If we put the antenna on Layer 1, the mismatch is 4.5/1, which is higher than 9.6/4.5 when put between Layer 2 and Layer 3.
- ◆ So we put the antenna between Layer 2 and Layer 3.

STRUCTURE DESIGN

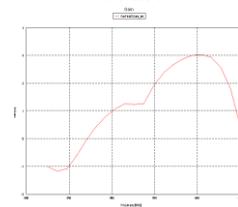


$L = 20.965\text{cm}$ $L1 = 6.531\text{cm}$ $L2 = 14.353\text{cm}$
 $W = 12.860\text{cm}$ $w0 = 2.887\text{mm}$ $s = 2.9014\text{cm}$

BROAD BANDWIDTH: 226.17MHz—381.66MHz (51.16%)



GAIN



ACKNOWLEDGEMENTS

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