



INVESTIGATION OF SUSTAINABLE  
POROUS CARBON AS RADAR  
ABSORBING MATERIAL

A. F. N. Boss<sup>1\*</sup>, H. R. Ferreira<sup>2</sup>, F. L. Braghiroli<sup>3,4</sup>,  
G. A. Amaral-Labat<sup>1</sup>, A. A. T. Souza<sup>5</sup>, H. Bouafif<sup>1</sup>,  
A. Koubaa<sup>3</sup>, M. R. Baldan<sup>5</sup>, G. F. B. Lenz e Silva<sup>1</sup>  
<sup>1</sup> Universidade de São Paulo; <sup>2</sup> Instituto Federal de  
São Paulo; <sup>3</sup> Université du Québec en Abitibi-  
Témiscamingue; <sup>4</sup> Centre Technologique des Résidus  
Industriels; <sup>5</sup> Instituto Nacional de Pesquisas  
Espaciais  
\*alan.boss@usp.br

**Abstract**

Radar Absorbing Materials (RAMs) are composite materials able to attenuate the reflection of an incident electromagnetic wave. Usually, RAMs are made of a polymeric matrix and an electromagnetic absorbent filler, such as silicon carbide or carbon black. Several materials have been investigated as potential fillers, aiming on the improvement of the reflection loss (RL) and its frequency broadening. In this paper, we investigate biochar as a potential filler. Biochar is a sustainable porous carbon made from biomass waste. We characterized five different composites, ranging from 1 wt.% to 5 wt.% of biochar in the silicone rubber. Although the RL did not present a significant result, biochar RAMs can be applied on a multilayer structure, that is able to attenuate the RL up to -32 dB at 8.2 GHz.

**Keywords:** Biochar, permittivity, RAM, sustainability, reflectivity