Transparent Antennas—Our Experience of Starting Research Projects

Transparent antennas are antennas that are transparent to light. They are extremely important in applications such as integration with solar cells or window glass. But, the question is how did we identify such a research topic? And, how did we get our research started and resolve issues that came along? This presentation is to share with you some of our experiences and approaches in achieving practical optically transparent antennas.

One very important application of transparent antennas is for very small satellites. As a satellite gets smaller, the surface area of it also gets limited. Therefore, the competition between the space for antennas and solar cells becomes prominent. This issue of limited space for antennas can be easily resolved if one can design optically transparent antennas and integrated them on top of solar cells. Hence, the starting point of our transparent antenna research is based on the demand of small satellite design. In order to design effective and highly transparent antennas, one needs to find out the optimal design method, prototyping technique, and accurate characterizing procedure to determine the antennas’ practical performance.

In this presentation, we will share our design approach, fast prototyping inkjet printing method, and how we constructed a state-of-the-art antenna measurement range.

Dr. Baktur’s research interests include antennas for small satellites, miniaturized multifunctional microwave circuits for wireless communication, and computational electromagnetics. She teaches courses in the areas of electromagnetics and microwave engineering.

Since joining USU in 2006, Dr. Baktur has established an updated anechoic chamber for antenna characterization, extremely low cost inkjet printing method for antenna prototyping, and a design laboratory. Her research projects are funded by National Science Foundation, US Navy, and the Space Dynamics Laboratory.