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Launch Vehicle and Spacecraft Transmitter Electromagnetic Compatibility

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Abstract: The Launch Services Program at NASA's Kennedy Space Center (KSC) is the primary gate for acquiring commercial vehicles to provide a cost-effective ride to space for NASA spacecraft. With the lunar Gateway, more human tended elements are planned for launch. One challenge facing the space industry is the proliferation of communication and science transmitters at frequencies beyond the qualification of space avionics and instruments. Studies have ensued to examine the intricacies of performing radiated susceptibility testing and analysis above 18 GHz. Changes in the launch vehicle communications interface to the range have also led to new launch vehicle antenna systems and more reliance on GPS and telemetry systems. Finally, research initiated at KSC in the area of predicted electric field distributions in launch vehicle payload fairings have spawned Small Business Technology Transfer initiatives for industry to investigate statistical algorithm and computational improvements in large payload fairing modeling of transmitters at frequencies in the GHz range. These topics, along with electromagnetic compatibility testing for launch vehicles will be discussed.



Dawn H. Trout received her B.S.E.E from Memphis State University in 1989, her MSEE from the University of Alabama in Huntsville in 1995 and her PhD in Electrical Engineering at University of Central Florida. In her thirty years at NASA, she has served as lead of electromagnetic teams at Marshall Space Flight Center in Alabama and at Kennedy Space Center in Florida and is now the electromagnetic discipline expert. She has initiated multiple electromagnetic related studies in her career and her current research interests include electromagnetic fields in large composite cavities, radiated testing above 18 GHz, and indirect lightning effects.