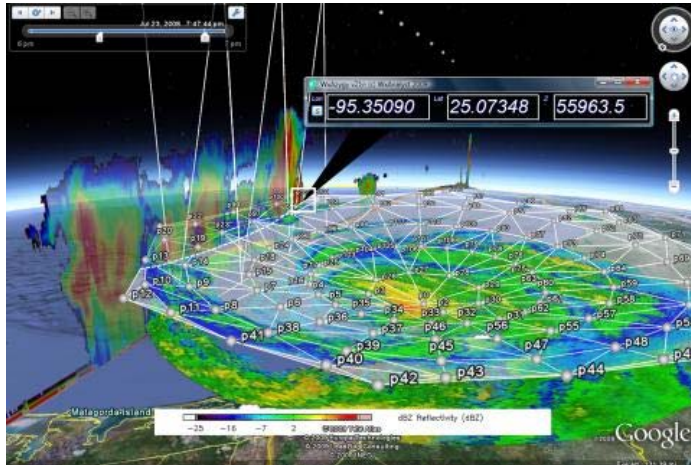


## COLLADA Computing 4DKMZ Approach to Weather Radar

Scott T. Shipley

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Weather radar information is mapped and animated in 3-Dimensions using COLLADA models on Google Earth. Radar beam occultation is theoretically calculated for the entire NEXRAD system using Digital Terrain Models, and is combined with NEXRAD reflectivity to verify signal blockage patterns. These data are combined and cross analyzed with simultaneous and collocated radar for independent sources in four dimensions. These "4DKMZ" techniques are beyond the general capabilities provided by most commercial Geographic Information Systems, and novel techniques must be innovated.



*4D intersection of two independent COLLADA model surfaces (dashed line). Intersected surfaces represent NEXRAD station KBRO (Brownsville, TX) during Hurricane Dolly at 1754 utc, and NASA CloudSat radar overpass at 1952 utc. The intersection supports cross-comparison of data from the two independent measurements.*

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Dr. Shipley is an Adjunct Professor with George Mason University, where he teaches Geography 309, Introduction to Climate and Meteorology. He worked for NASA at the Langley Research Center for 6 years, then moved to private industry in 1986. His 20+ years of experience with private industry includes STX, Hughes, Raytheon, and Earth Resources Technology. Dr. Shipley joined the Department of Geography at George Mason University in 1991, and was appointed Research Professor in 2007. He started WxAnalyst in July 2007. Scott is known for his work in lidar (co-inventor of the High Spectral Resolution Lidar) and Geographic Information Systems (GIS). He assisted NOAA's National Weather Service in its development of ASOS, NEXRAD and AWIPS, and served as Raytheon's Program Lead for NPOESS Ground System algorithms, calibration and validation. Most recently, Dr. Shipley has been developing new Virtual Globe capabilities for the display and analysis of radar, lidar and satellite information. He directed NASA SBIR 2008-1 S6.04-9159, entitled "GIS Function Coupling for Virtual Globes", and which moved directly from SBIR Phase I to Phase III with NOAA funding in August 2010.

Recommended references:

Shipley, S.T., A. Peterlin and S. Cantrell (2009) Radar visualization and occultation in 4-dimensions using Google Earth; 25<sup>th</sup> IIPS, AMS Annual Meeting, Phoenix, AZ.

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