

Third Generation (3G) CDMA2000 Cellular Simulator

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W900 Capability Development Funding

The logo for the MITRE Technology Program, featuring a stylized graphic of stacked blocks in yellow, orange, and blue to the left of the text.

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Problem

- **The Second Generation (2G) CDMA IS-95A cellular networks have been deployed for almost 8 years. Although the system design rules and operating procedures for voice services (i.e., IS-95A services) are well established and understood, with the launch of Third Generation (3G) CDMA2000 1x high-rate data service worldwide in year 2002, these rules and procedures need to be re-examined.**

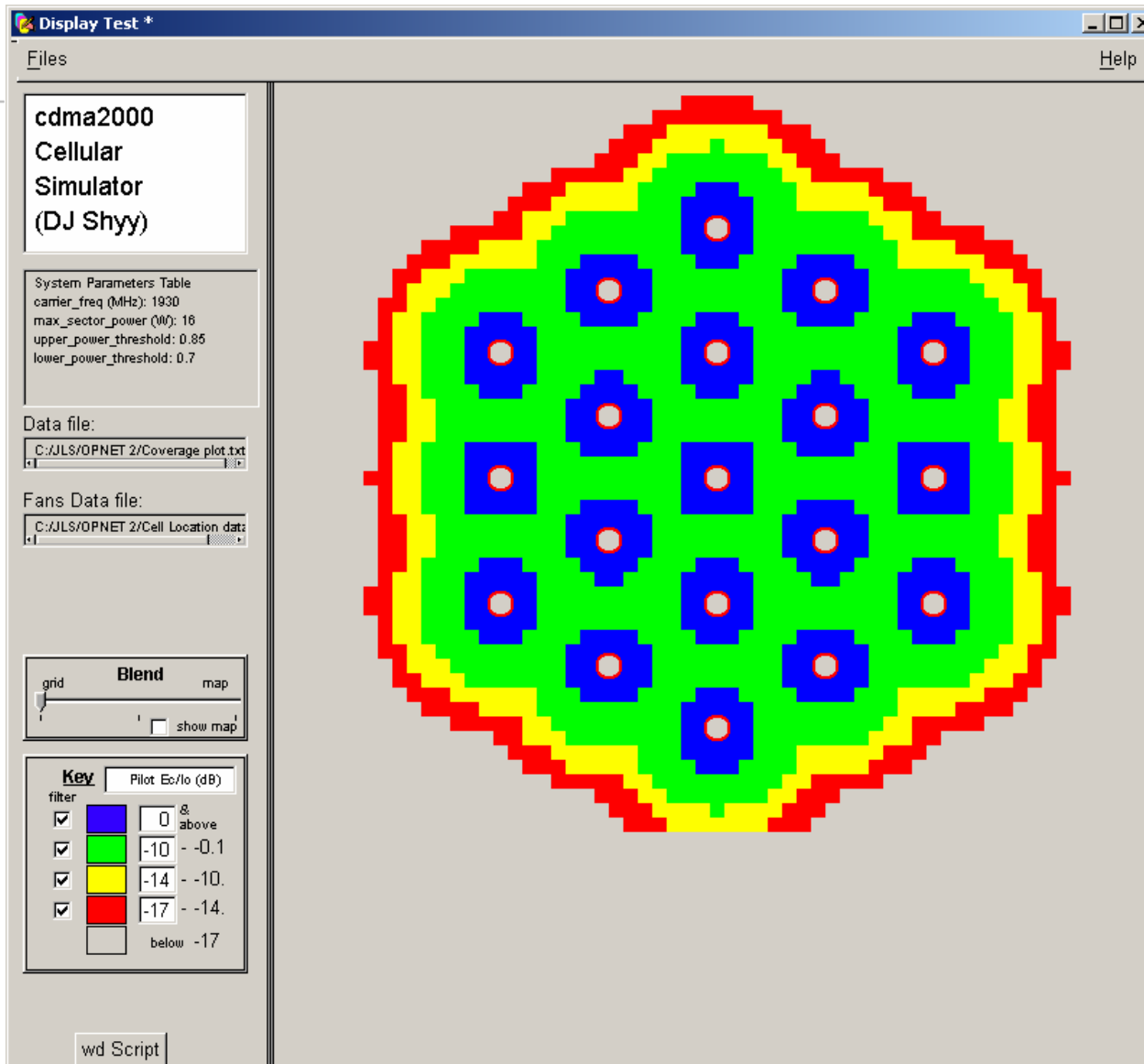
Objective

- **The purpose of this project is to build a 3G CDMA2000 cellular simulator, which mimics the real operation of CDMA2000 protocols, using OPNET Modeler.**
- **The 3G CDMA2000 simulator will be used to investigate various design issues of CDMA2000 networks such as voice/data coverage, voice/data capacity, data performance, and packet data admission control algorithms.**

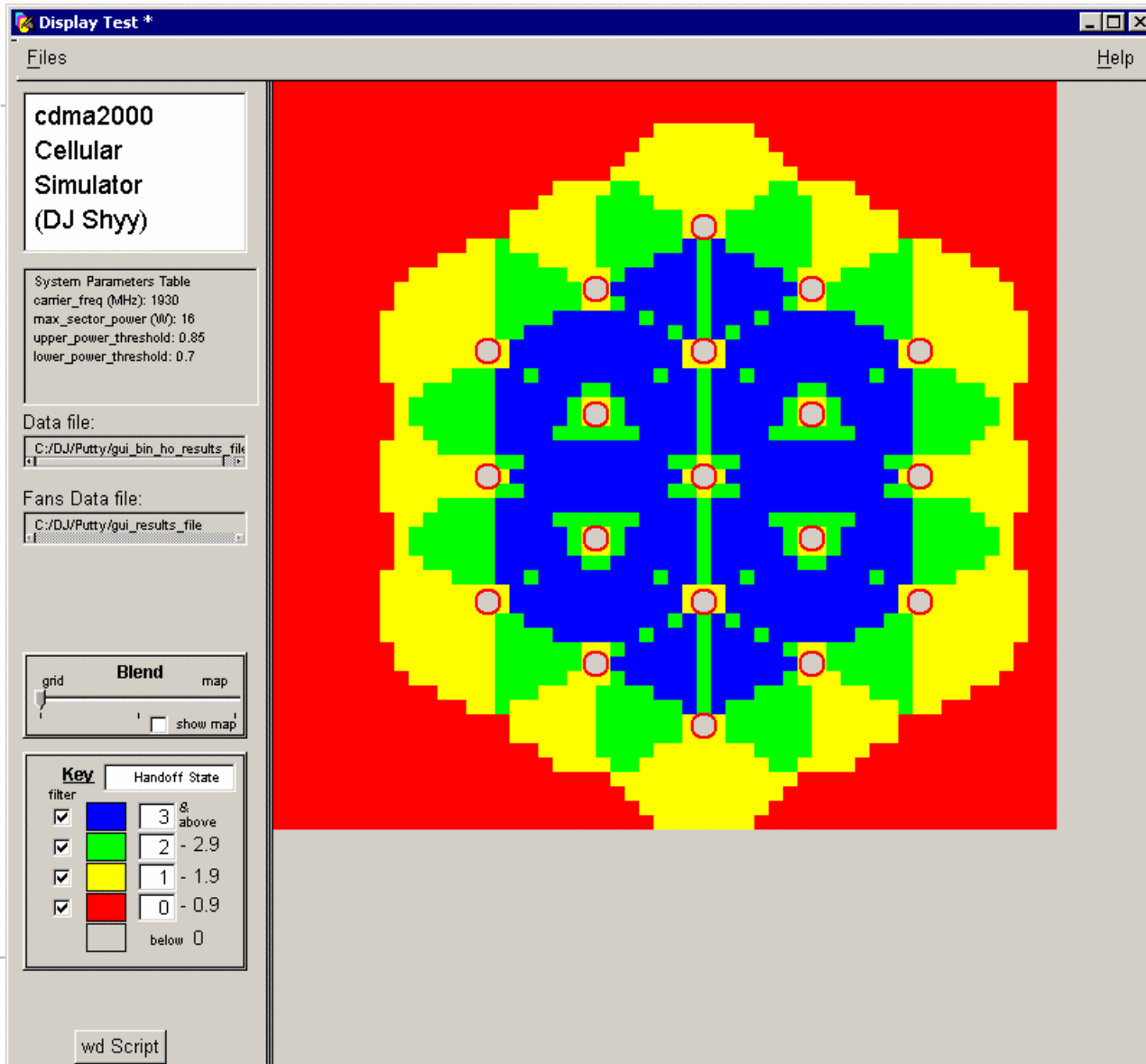
Activities

- **This project has two major activities.**
 - **The first is to develop the OPNET cellular simulator following CDMA2000 standards.**
 - **The second is to integrate the physical layer cellular model (using Signal Processing WorkSystem) developed by industry into the OPNET cellular simulator to become a complete CDMA2000 cellular simulator.**

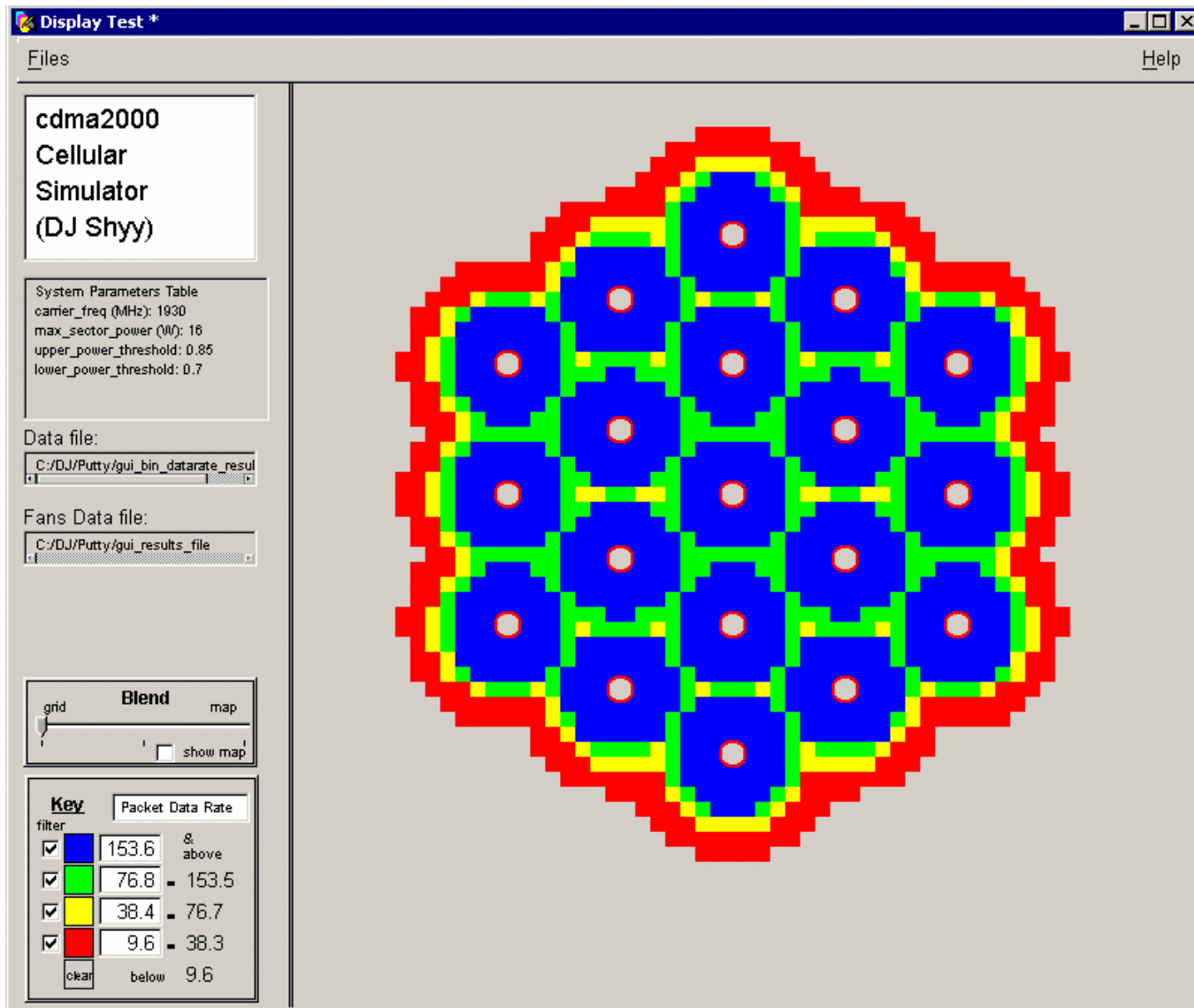
Highlight: Pilot Coverage Plot



Highlight: Soft Handoff State Plot



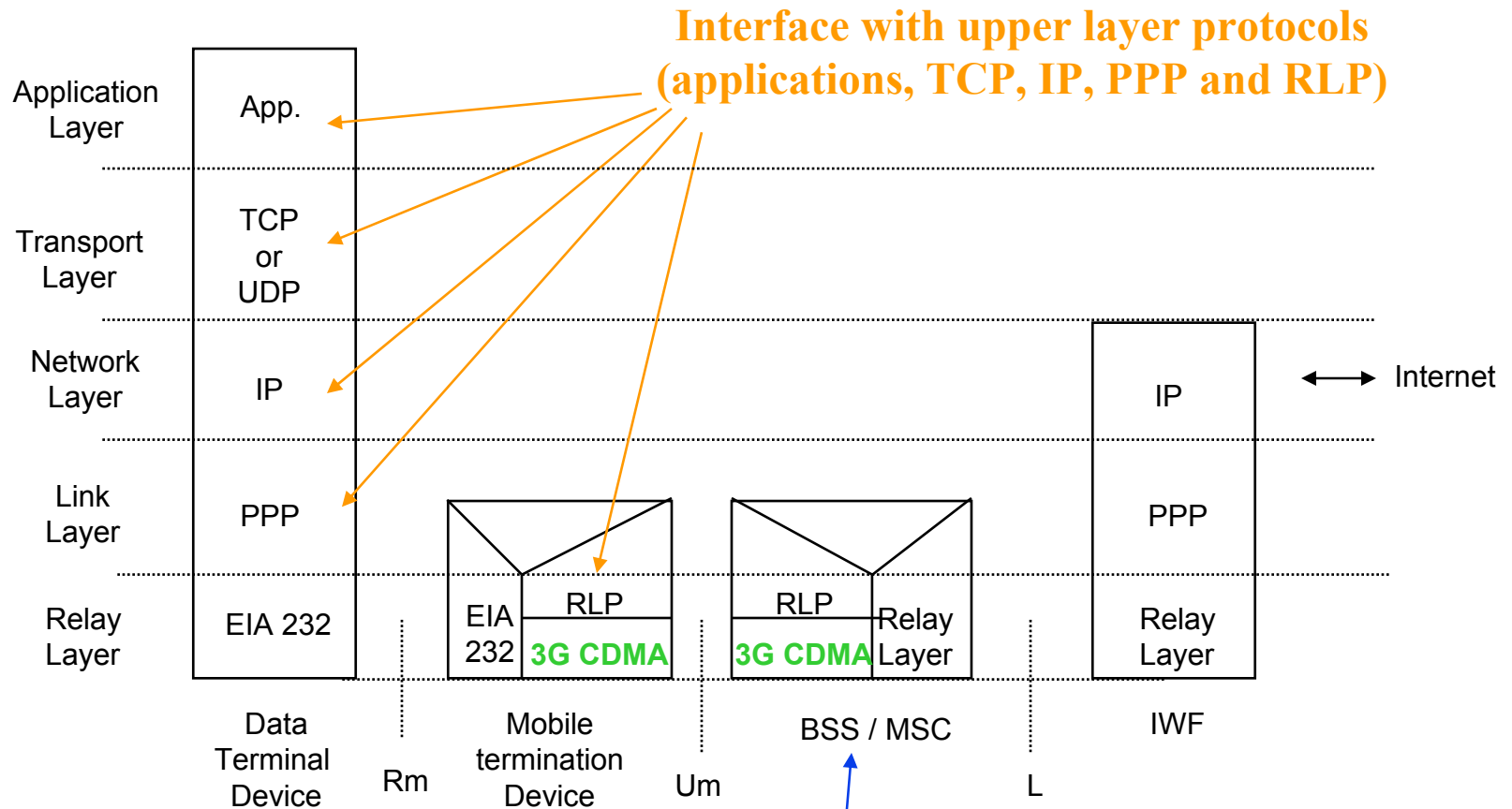
Highlight: Packet Data Rate Coverage Plot



Impacts

- **This project will advance MITRE and government knowledge in 3G CDMA2000.**
- **The results are applicable to various military wireless networks that deploy CDMA technology such as the wideband networking waveform in the Joint Tactical Radio System (JTRS), Near Term Digital Radio (NTDR), Small Unit Operation-Situation Awareness System (SUO-SAS), and USC-28.**

Future Plans



Develop packet data admission control algorithms