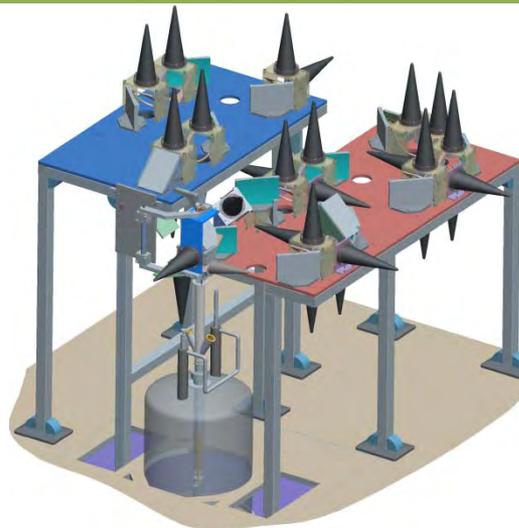


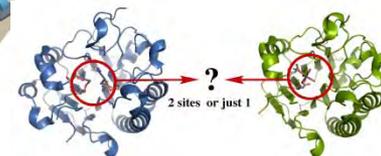
# High-Field Electron Paramagnetic Resonance (EPR) (95-GHz) System

## Capability/Need

- Designed not only for **high field** (10 times conventional EPR), but **high power** – 1 kW (vs 70-400 mW), sharply reducing acquisition time
- Will be **one of only three** high-field EPR systems with the high power capability worldwide
- Allows the study of unusual metal centers like Ni(II) that are “EPR silent” at low field
- Spectra of “molecular magnet” systems [e.g., Mn(II)] are much easier to interpret

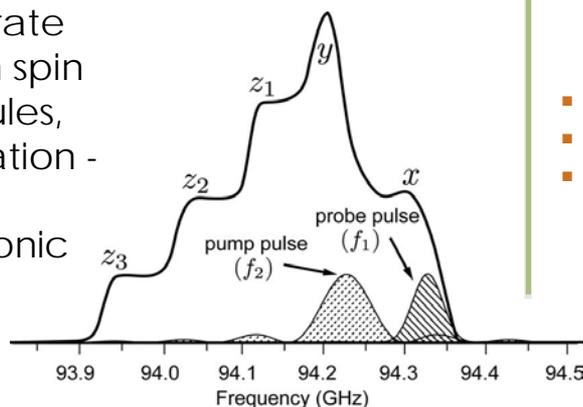


- High-Field EPR – use superior quasi-optical bridge with microwave absorbing cones
- Cleaner power transmission vs. conventional systems



## Science/Users

- high-field EPR is the method of choice for studying electron transfer in photosynthesis and other water splitting systems
- High-field EPR can provide high accurate distances between spin labels in biomolecules, but also the orientation - leading to better modeling of electronic potentials in metal centers



## EMSL Strategy Alignment; Specifics

- Science themes: Science of Interfacial Phenomena; Biological Interactions/Dynamics; Geochemistry/Biogeochemistry and Subsurface Science
- Cross-cutting challenges: Design/Synthesis of Complex Materials; Predict Biological Function; Linking Theory/Experiment
- EMSL capability area: NMR and EPR
- Anticipated availability: January 2011
- Technical POC: David Hoyt