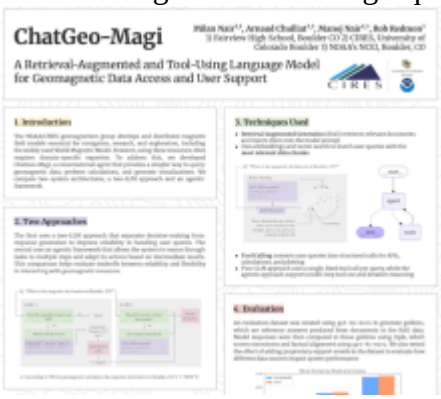
Milan
Nair
University of Colorado, Boulder & Fairview High School
Arnaud Chulliat, NOAA NCEI & University of Colorado, Boulder
Manoj Nair, NOAA NCEI & University of Colorado, Boulder
Rob Redmon, NOAA NCEI
Poster
The geomagnetism group at NOAA/CIRES develops and distributes magnetic field models essential for navigation, exploration, and research. However, accessing these specialized datasets often requires domain expertise to navigate complex interfaces. We introduce ChatGeo-Magi, a conversational AI agent that leverages Retrieval-Augmented Generation (RAG) and structured tool calling to provide intuitive, grounded access to geomagnetic resources. We compare two architectures: a two-LLM system for reliable single-stage API interactions and an agentic framework enabling multi-step reasoning. The system can query NOAA geomagnetic APIs, perform calculations for magnetic field components, and generate time-series plots and contour maps, in addition to answering domain specific questions. Evaluation across three local models reveals that simply expanding the RAG corpus with proprietary support emails yields limited improvements, highlighting that data quality and retrieval precision matter more than corpus size alone. The agentic system demonstrates superior flexibility for complex queries, demonstrating the potential of LLMs in geoscience applications while underscoring the need for high-quality domain data.



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