FACULTY OF SCIENCE
THE UNIVERSITY OF HONG KONG
香港大學理學院

DEAN
Professor Matthew R Evans

Press Release For Immediate Release

HKU receives a large donation of 3D kinematics software for geoscience research

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As global energy and technology needs continue to grow and transform, so do our resource needs. Many of these resources are extracted from the Earth. For example, the use of rare earth metals has vastly expanded in recent years, as these are increasingly used in modern communication and battery technologies. The tools by which we explore for key geological resources are undergoing a parallel evolution, becoming increasingly potent for use characterizing three-dimensional resource settings and development. These tools can similarly be used to produce academic research discoveries, particularly in terms of creating quantitative models of solid planetary systems.

In pursuit of such discoveries, the Faculty of Science is pleased to announce a large donation of geological exploration software from Petroleum Experts Ltd to The University of Hong Kong. The full monetary value of this donation is £2,082,391.97 (equivalent to roughly HKD 21.2 million). The donation includes ten sets of the MOVE suite of programs, which represents world-leading geological reconstruction software that principally supports petroleum applications in the industrial realm and advances crustal tectonics exploration in the academic realm. The specific interlinked programs are MOVE, 2D Kinematic Modelling, 3D Kinematic Modelling, Geomechanical Modelling, Sediment Modelling, Fracture Modelling, Fault Response Modelling, Fault Analysis, Stress Analysis, MOVE Link for Petrel, MOVE Link for OpenWorks, and MOVE Link for GST. Continuing free software updates are included, as well as the HARDLOCK system for hosting the software on the university servers.

“We are pleased and grateful to receive this donation of powerful software. It will be used extensively in our expanding lithospheric tectonics and Earth evolution research. MOVE is the leading industrial software for exploration of crustal development in three-dimensions-plus-time. This is of course critical for petroleum exploration, but also holds vast academic promise. Our Faculty’s team of solid Earth researchers are going to benefit tremendously from its capacity for rapid generation of highly detailed kinematic reconstructions,” said Professor Matthew Evans, Dean of the Faculty of Science.

The donated software will allow HKU geologists to characterize complex geologies in 3D, quantitatively reconstruct the development of these geologies through time via a vast array of embedded process tools, perform forward and reverse modeling of such models, and explore the concomitant stress evolutions of the explored geological systems. The software can further be coupled to other leading industrial software, such as Petrel, and academic numerical tools like PECUBE thermo-kinematic code. As such, MOVE is a key tool for simulating sedimentary and deformation system evolutions, from basins and deltaic systems like the Pearl River delta, to the development of mountain belts like the Andes and Himalaya, to oceanic rifting systems like the South China Sea.

Some uses may even be extra-terrestrial! Associate Professor Dr Joseph Michalski of the Department of Earth Sciences comments: “MOVE is basically the geologist’s leading tool for performing one of our core tasks, which can be colloquially described as ‘putting Humpty Dumpty back together again.’ For example, we’re

studying features on Mars that may represent either deformed impact craters, or deformed volcanoes, so we're looking forward to harnessing MOVE's unique reconstructive capacities to better test between these possibilities."

Knowledge exchange between the petroleum industry and academia has deep roots. Associate Professor Dr Alexander Webb of the Department of Earth Sciences notes: "From a historical perspective, petroleum exploration is responsible for developing large swaths of the modern field of structural geology. The motivation for technical advance is straightforward: millions and even billions of dollars of investment depend on accurate, precise, and exportable understanding of resource-bearing geological systems. Here in academia, we've employed industrial tools for a greater variety of problems, for example building quantitative understandings of how continents rift apart and how they collide together. We look forward to further developing this rich tradition via MOVE-enabled research at HKU."

More about Petroleum Experts Ltd: https://www.petex.com//

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Image download: https://www.scifac.hku.hk/press

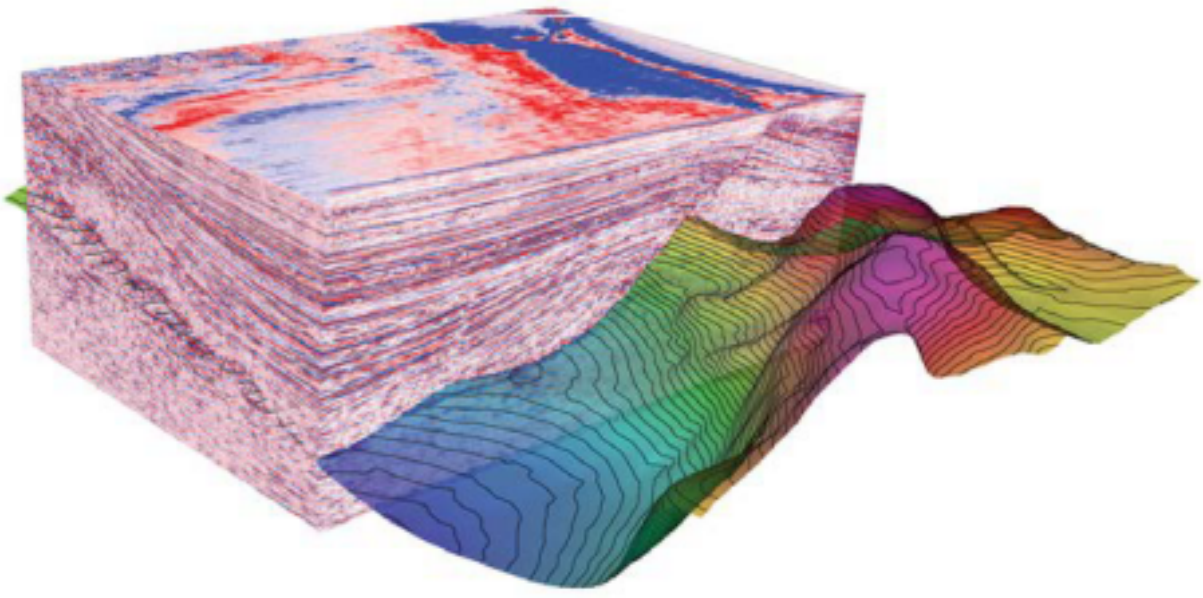

Image 1: An illustration of 3D seismic data analyzed via MOVE, permitting 3D modeling of the fault surface and deformed layers in an extensional basin.

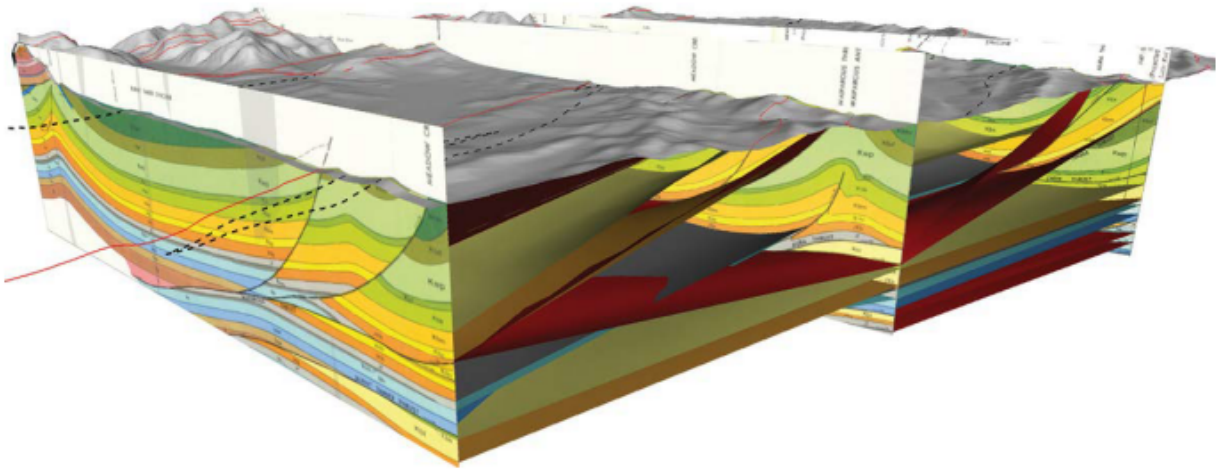

Image 2: Detailed 3D model-building of a complex contractional tectonic system.