Drones Geophysical Survey Technology

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SUMMARY

Geophysical drone surveys utilize Unmanned Aerial Vehicles (UAVs) to collect geophysical data efficiently and cost-effectively, offering innovative solutions for extractive industry hydrocarbon, mineral exploration, environmental studies, and geological mapping. Geophysical Drone Surveys Geophysical drone surveys is employed for magnetics, electromagnetics, ground-penetrating radar (GPR), gamma-ray spectrometry radiometric , LIDAR, seismology, reflection Seismic survey,etc. Drones provide a unique advantage by accessing difficult terrains and covering large areas quickly and economically. Drone-based Ground Penetrating Radar (GPR) data acquisition involves an autonomous drone transmitting electromagnetic waves into the ground and receiving reflections from subsurface features, such as buried objects, different soil layers, or glacial ice glaciology, wetland minerals exploration, high altitude wetlands. Drone LiDAR data acquisition involves using a drone with an attached LiDAR sensor to emit laser pulses and record their return time to create a detailed, 3D point cloud of the surveyed environment, Green Lidar Drone Coastal Ocean Floor Mapping.

Drone-based reflection seismic data acquisition uses drones to position seismic sources and receivers for mapping subsurface structures. Autonomous systems can efficiently collect high-resolution subsurface images by detecting reflected seismic waves from geological interfaces, enabling detailed 3D subsurface imaging for applications in mining and other geophysical surveys. Seismic Surveying with Drone-Mounted Geophones-Seismic imaging is the primary technique for subsurface exploration. An ornithopter drone that performs seismic surveys is a cutting-edge concept where the unique flapping flight of an ornithopter is combined with sensors for ground-penetrating data acquisition. An ornithopter drone seismic system likely refers to an unmanned aerial vehicle (UAV) that uses flapping wings to mimic natural bird flight and is equipped with seismic sensors to detect ground vibrations, potentially for earthquake monitoring or

underground surveys.Integrated Offshore Seismic Survey Using an Unmanned Wave Glider-An Autonomous Surface Vehicle(ASV), known as a wave glider, used to record refracted and reflected signals from a seismic source penetrating the shallow subsurface. These survey systems are used to acquire wide-offset seismic survey data from specific areas, such as offshore structures. The wave gliders can collect seismic refraction and reflection data, which can be used to estimate subsurface information, e.g., acoustic wave velocity and subsurface structure to calculate the velocities of shallow sedimentary deposits and the acoustic basement.Blue Ocean Seismic Services (BOSS) underwater autonomous vehicle for surveys), revolutionize marine seismic acquisition ocean bottom seismic (OBS) ocean bottom nodes OBN data for oil and gas monitoring and renewable energy projects.