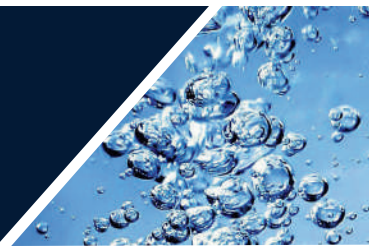
Electrical Capacitance Volume Tomography



Tech4Imaging uses advanced capacitance-based technology to detect and image solid particle, liquid, and gas based flows and other volumes. We design sensors that use electric fields to allow us to determine the content of a vessel by generating a 3D image and calculate certain properties like velocity and volume of each phase. Our technology can be applied to solve a variety of problems, including mass flow imaging and multi-phase flow monitoring.

Customizable
Our solutions are scalable and tailor-made to solve your specific problem.

Safe & Small
Produces no radiation, consumes little power, small and lightweight.

Real-Time
Responsive, integral solutions to meet your needs and help you make decisions quickly.

Non-Invasive
Our solutions use no intrusive probes to provide the data you need without interrupting your process.

Service
A dedicated engineering team partners with you to provide support from start to finish.

AIR-WATER SYSTEMS

We provide void and flow information about air-water systems in real-time.

Examples include:
- Water flow metering for geothermal wells
- Air bubble imaging and tracking
- 3-D velocity profiling in air-water phase separators in microgravity

GAS-SOLID SYSTEMS

We analyze the motion of particles for critical solids handling applications.

Examples include:
- Solids deposition in high-velocity transport chutes
- Velocity profiling in a packed bed
- Solids motion analysis in a fluidized bed

MULTI-PHASE SYSTEMS

We investigate the complex interactions within multi-phase flows to give you a complete picture of your process.

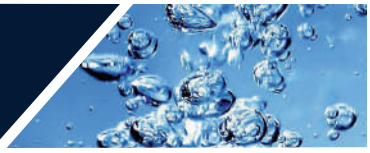
Examples include:
- Studying gas and liquid rich areas in a compacted bed reactor
- Gas, oil, and water meters for petroleum industries
- Measuring solid depositions and gas bubbles in a liquid flow loop

Contact us to discuss your custom solution

1910 Crown Park Ct. Columbus, Ohio 43235 • 614-725-1778 • www.tech4imaging.com

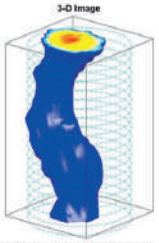
TECH4IMAGING

Creating Value Through Innovation

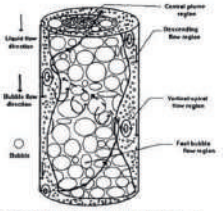


AIR-WATER SYSTEMS

Conventional flow meters can only measure the average flow rate of water and disturb the flow itself. However, water volume fraction, velocity profile, and flow regime are also critical pieces of information within an air-water flow. The tracking of air bubbles is a major concern in many applications. Our multi-dimensional approach allows us to fully analyze the behavior of air-water systems. With our non-invasive sensor, water volume fraction, 3-D velocity profile, mass flow rate, and phase distribution can be obtained in real-time. We can accurately measure void fractions from 3% to 100%, and water temperature and salinity levels can be calibrated and included for a complete analysis of the flow.



ECVT Experiment: A typical spiral locus for a bubble cluster (gas: 0.06m/s)

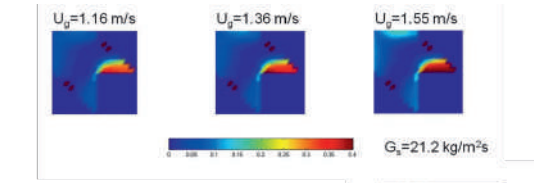


Model: Flow structure in a 3-D gas-liquid bubble column (Chen RC, 1994)

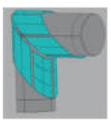
Our multi-dimensional approach allows us to fully analyze the behavior of air-water systems.

GAS-SOLID SYSTEMS

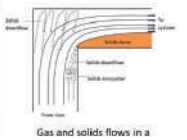
Most instruments can only determine the speed and solid density at a single point within a flow or an average solids velocity, leaving the user with an incomplete understanding of the flow's true nature. Our solutions for gas-solid systems provide a more thorough picture of solids movement. We obtain solid volume fraction, 3-D velocity profile, mass flow rate and mass distribution in real-time. We support a near-infinite number of solid materials and can analyze a variety of particle sizes ranging from discrete particles (mm scale) to fine powders (μm scale). Multi-dimensional measurements allow us to analyze multiple solids simultaneously and differences in particle size and material can be detected.



ECVT sensor



ECVT sensor design



Gas and solids flows in a 90-degree bend (from Harris et al., 2003).

Our solutions for gas-solid systems provide a more thorough picture of solids movement.

MULTI-PHASE SYSTEMS

In more complex processes, multi-phase flows can be very difficult to analyze with a single instrument. Our multi-dimensional measurements allow for accurate analysis of these flows without disruption. Our low-frequency excitations allow us to measure Maxwell-Wagner-Sillars polarization between two discrete phases. This is one such method employed to analyze these complex flow structures. Many situations involve multi-phase flows of varying types so our solutions are custom built to fit your problem. Our sensors can be built to any size and shape, and have been tested in temperatures up to 900˚C and pressures up to 35 MPa, and your customized software package will provide clear, concise answers to your most pressing questions.

Our sensors can be built to any size and shape.

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