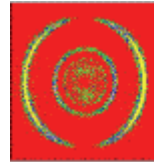
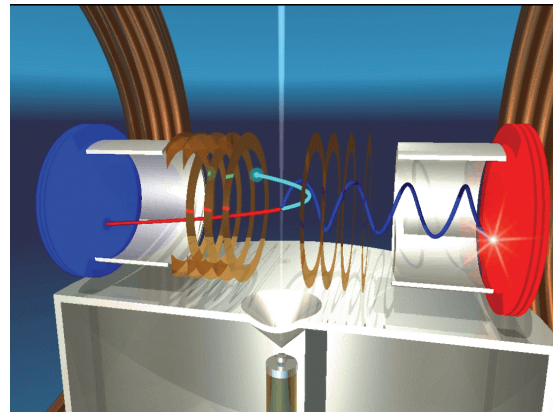


# COLTRIMS spectrometer systems

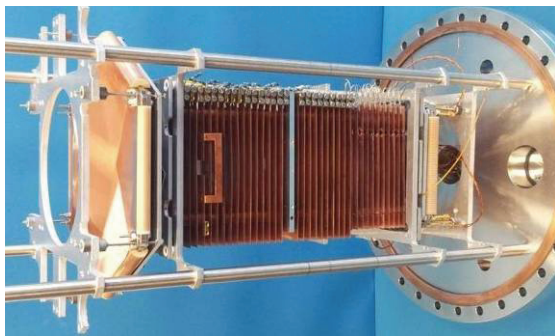


**RoentDek**  
Handels GmbH  
Supersonic Gas Jets  
Detection Techniques  
Data Acquisition Systems  
Multifragment Imaging Systems

The **C**old **T**arget **R**ecoil **I**on **M**omentum **S**pectrometer was developed for the spectroscopy of atomic and molecular reactions. Several atomic physics groups contributed to the technique and nowadays so-called Reaction Microscopes provide the most detailed insight into the correlated dynamics of objects on atomic scale, like atoms, molecules and clusters. The technique involves a supersonic gas jet target, a well defined electrostatic field and position&time-sensitive particle detectors e.g. **RoentDek** DLD or HEX.



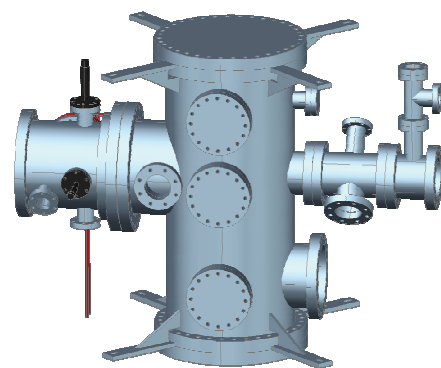
## Spectrometer



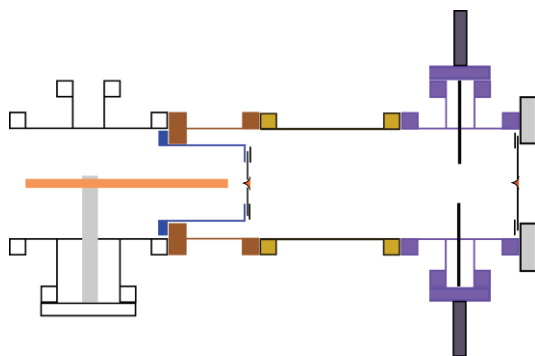
**RoentDek** offers several modularly designed spectrometers for different detector sizes. Any spectrometer can be easily modified in length or electrostatic field geometry to adjust for varying experimental needs. The picture to the left shows a flange-mounted spectrometer for detectors with an active area of about 80 mm in diameter (here in combination with **HEX75** and **DLD80**). Most **RoentDek** target chambers allow for a fixed-to-the-chamber mounting option in addition.

## Supersonic Jet Systems:

The target density of a gas jet can be matched to different experimental needs. The maximum target density (e.g. for experiments with UV light or synchrotron) will be reached with a specialized CF300 target chamber (“302”) in combination with the Jet Source Type 2 (JS2). Such a 2-stage **Dense Jet** set up requires also a 2-stage Jet Dump to keep good vacuum conditions inside the target chamber during Jet operation (picture to the right).



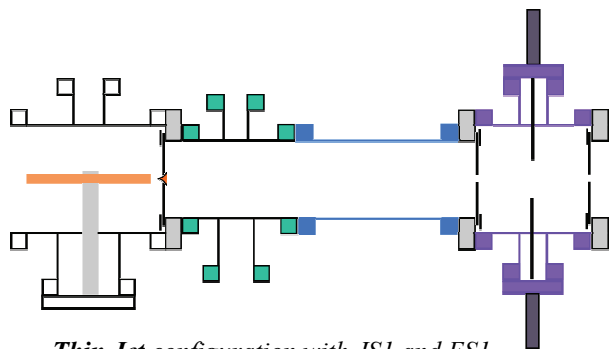
*Dense Jet configuration with chamber 302*



*Thin Jet configuration with JS2 and ES2*

A **Dense Jet** set up can be converted into a 3-stage **Thin Jet** configuration (e.g. for IR laser experiments) by inserting the Elongation Stage Type 2 (ES2). The Jet Source needs to be separated from the target chamber and is typically supported by an independent frame that can be moved backwards. Parts of ES2:

- CF200 Jet Extension
- CF200 straight connectors
- CF200 4-jaw apertures (+1xCF63 +1xCF38)



Thin Jet configuration with JS1 and ES1

Alternatively (e.g. for smaller target chambers) a **Thin Jet** can be realized by choosing the Jet Source Type 1 (JS1) in combination with the Elongation Stage Type 1 (ES1). Parts of ES1:

- CF150 Jet Extension (+1xCF63 +1xCF38)
- CF150 straight connectors
- CF200-CF150 reducer
- CF200 4-jaw apertures (+1xCF63 +1xCF38)
- CF200-CF150 reducer

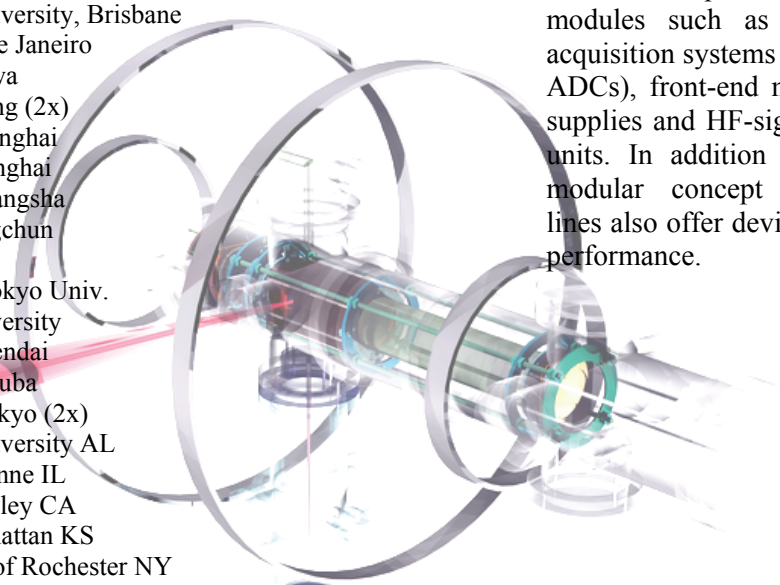
Only a **Thin Jet** set up build with JS2 (Jet Source Type 2) can easily be turned into a **Dense Jet** configuration by combining JS2 with an appropriate target chamber.

## COLTRIMS

**RoentDek** builds custom-designed COLTRIMS systems ranging from complete setups to individual and modular spectrometer solutions. New aspects can be implemented with the help of our Research and Development team and in close collaboration with the customer. COLTRIMS is well known worldwide and established in atomic physics and it was already applied in other fields such as solid state physics and surface science.

Complete systems were designed for:

- ARG: CAB, Bariloche
- AUS: Griffith University, Brisbane
- BRA: PUC, Rio de Janeiro
- CAN: NRC, Ottawa
- CHN: PKU, Beijing (2x)  
ECNU, Shanghai  
SIOM, Shanghai  
NUDT, Changsha  
JLU, Changchun
- JOR: HU, Zarqa
- JPN: Kashiwa Tokyo Univ.  
Tokyo University  
TAGEN, Sendai  
AIST, Tsukuba  
RIKEN, Tokyo (2x)
- USA: Auburn University AL  
ANL, Argonne IL  
LBL, Berkeley CA  
KSU, Manhattan KS  
University of Rochester NY



**RoentDek** products include numerous sophisticated electronic modules such as different data acquisition systems (TDCs and fast ADCs), front-end modules, power supplies and HF-signal decoupling units. In addition to the general modular concept most product lines also offer devices of differing performance.

Numerous other groups running COLTRIMS-type experiments (*Velocity Imaging, Reaction Microscopy*) employ TOF spectrometer assemblies and jet target formation parts from **RoentDek** and use the **DLD** and **HEX** detectors as key components, among those:

- AUT: TU Wien
- CHE: ETH, Zürich
- FRA: ISMO + SOLEIL, Paris
- GER: MPI-K, Heidelberg
- GBR: STFC, Daresbury
- IND: Banaras Hindu University, Varanasi
- NLD: Vrije Universiteit + FOM
- USA: JILA, Boulder CO

**RoentDek** offers standard product assemblies as building blocks of a custom COLTRIMS system. These products may be completed with any (pairing of) **DLD** or **HEX** detector and recommended read-out electronics. It is to note that COLTRIMS is most powerful when two **HEX**-type detectors with active diameter of 75mm or more are used.