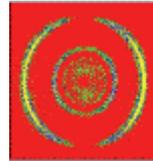
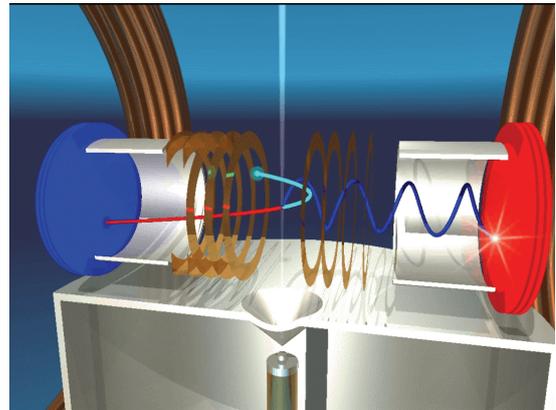


COLTRIMS spectrometer systems

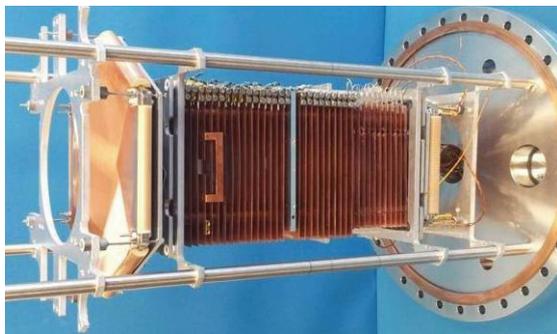


RoentDek
Handels GmbH
Supersonic Gas Jets
Detection Techniques
Data Acquisition Systems
Multifragment Imaging Systems

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.



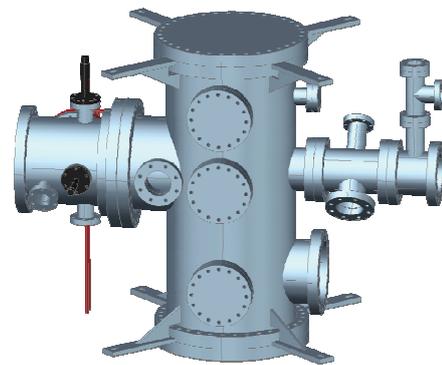
Spectrometer



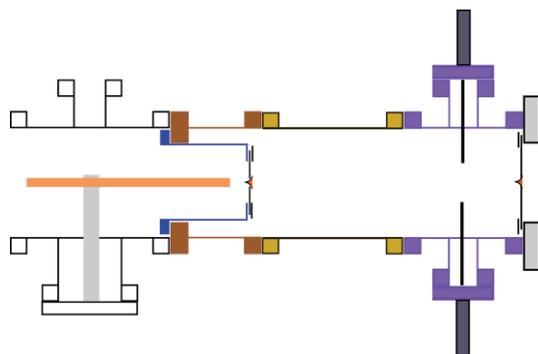
RoentDek offers several modularly designed spectrometers for different detector sizes. Any spectrometer can be easily modified in length or electrostatic field geometry to adjust for varying experimental needs. The picture to the left shows a flange-mounted spectrometer for detectors with an active area 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).



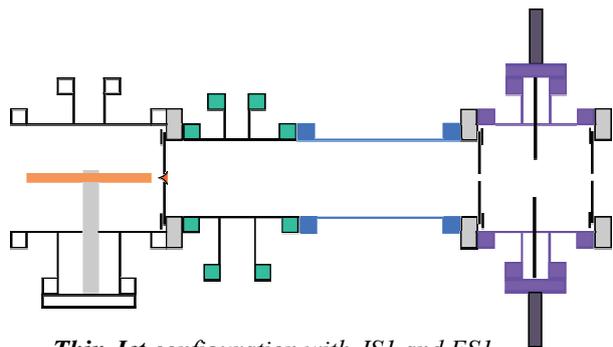
Dense Jet configuration with chamber 302



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.