

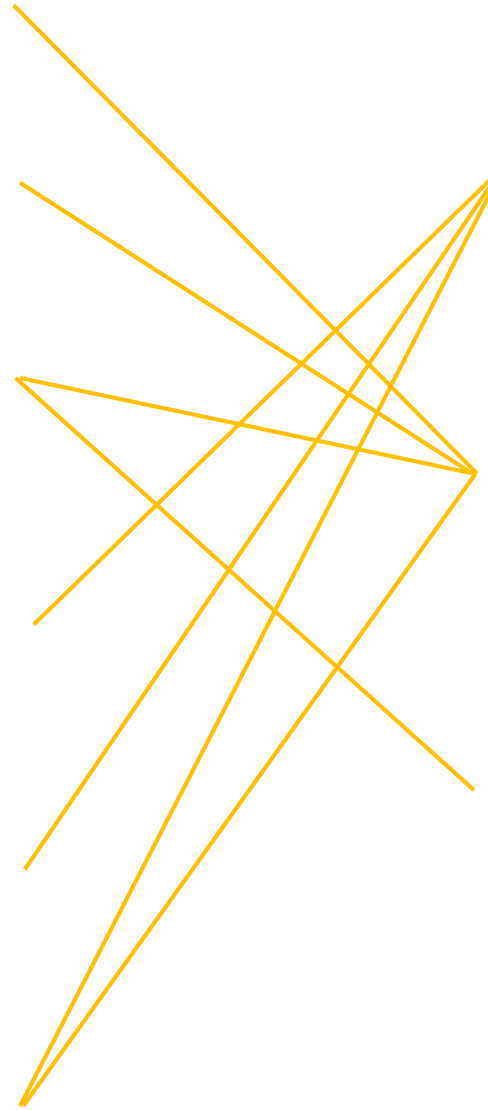


HMC Welcome Meeting

Klaus Kiefer (HZB), 30 March 2022

Content

- What is your project about and who are your partners?
 - a brief history of SECoP
 - metadata in SECoP
 - SECoP@HMC project structure
- How can HMC support your project (infrastructure, tools, ...) to be successful?
- Where do you see the linkage to HMC and how do you plan to integrate your project results?



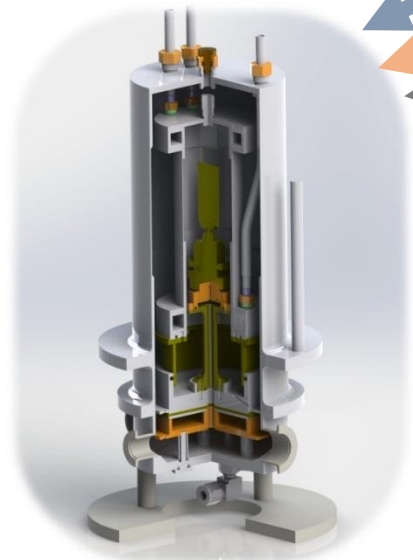
Neutrons

Photons

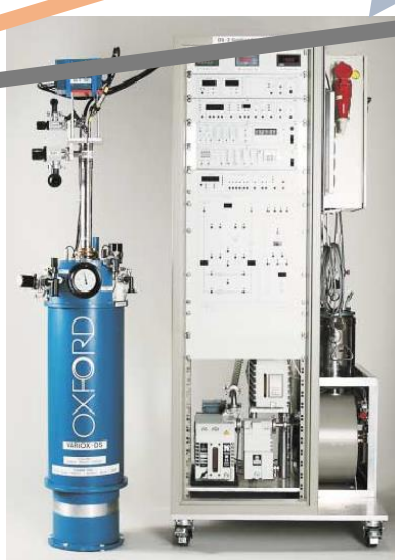
High Magnetic Fields



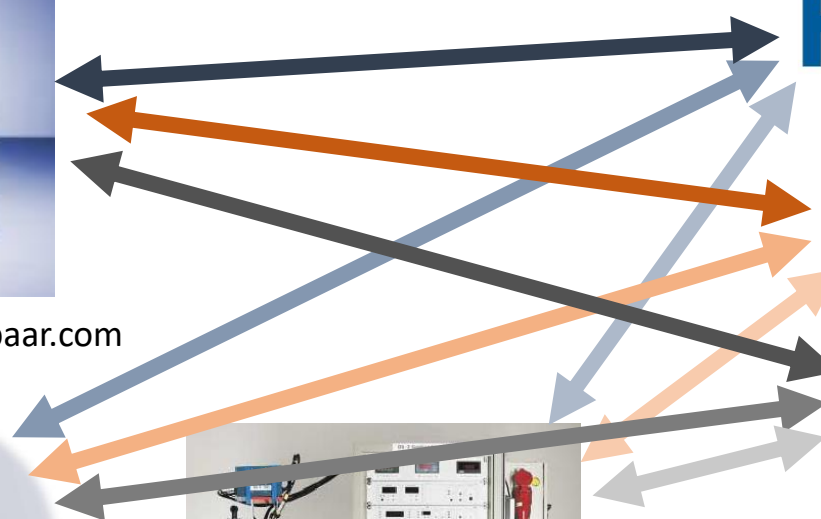
Rheometer, anton-paar.com



Humidity cell, HZB/ILL

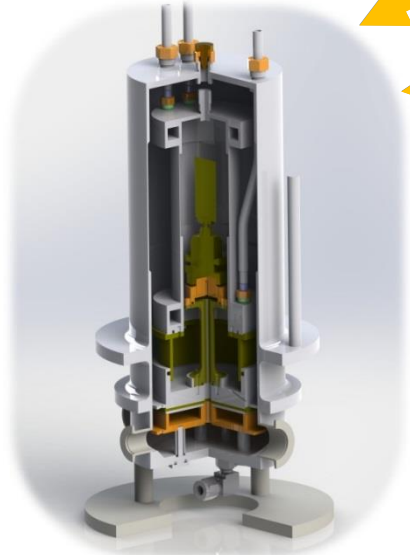


Dilution Stick, Oxford Instruments





Rheometer, anton-paar.com



Humidity cell, HZB/ILL



Dilution Stick, Oxford Instruments



SECoP



**simple, inclusive, self explaining
provides metadata**

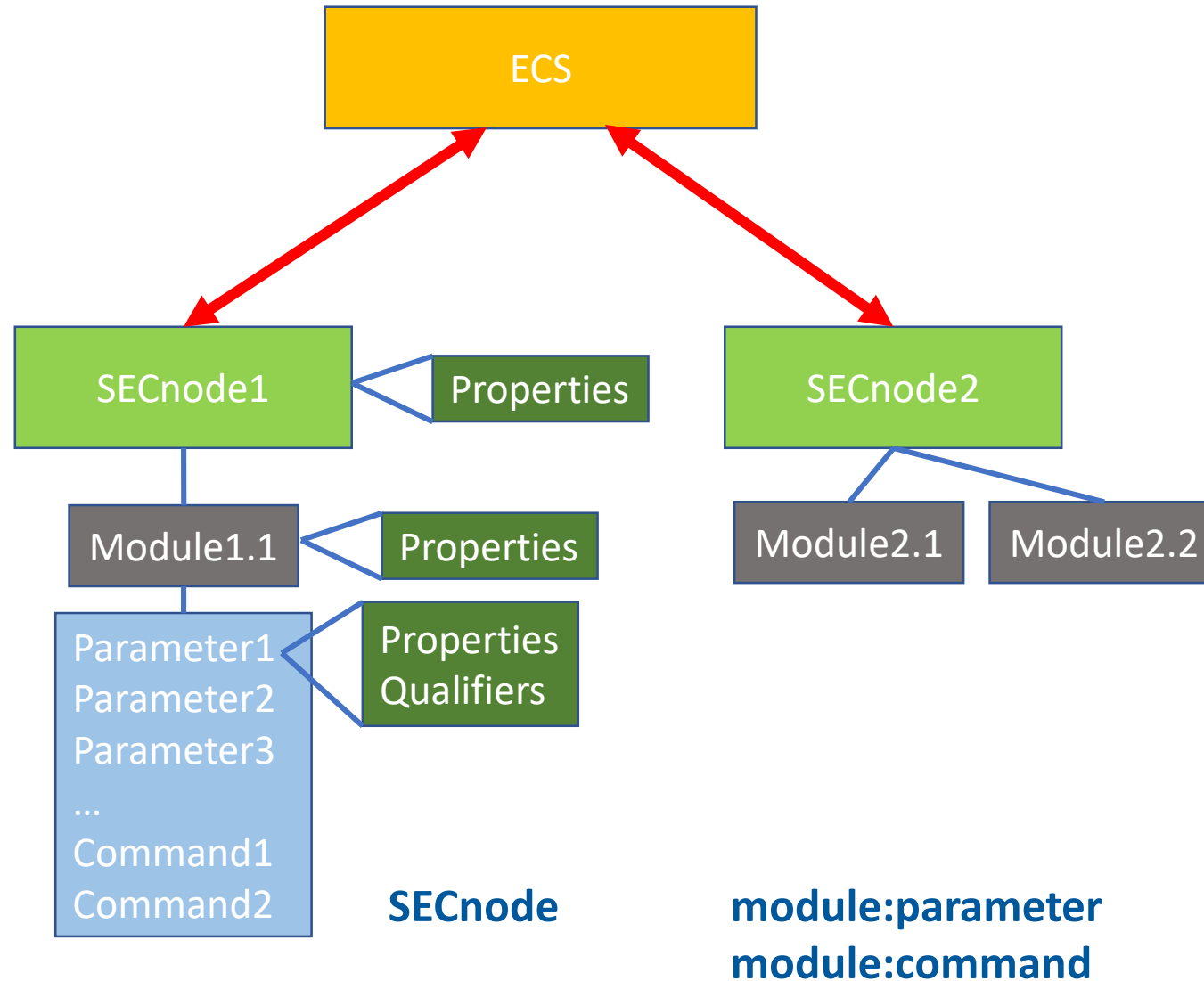
www.github.com/SampleEnvironment/SECoP

K. Kiefer *et al.*: An introduction to SECoP – the sample environment communication protocol
2019, Journal of Neutron Research 21(3-4):1-15, DOI:10.3233/JNR-190143

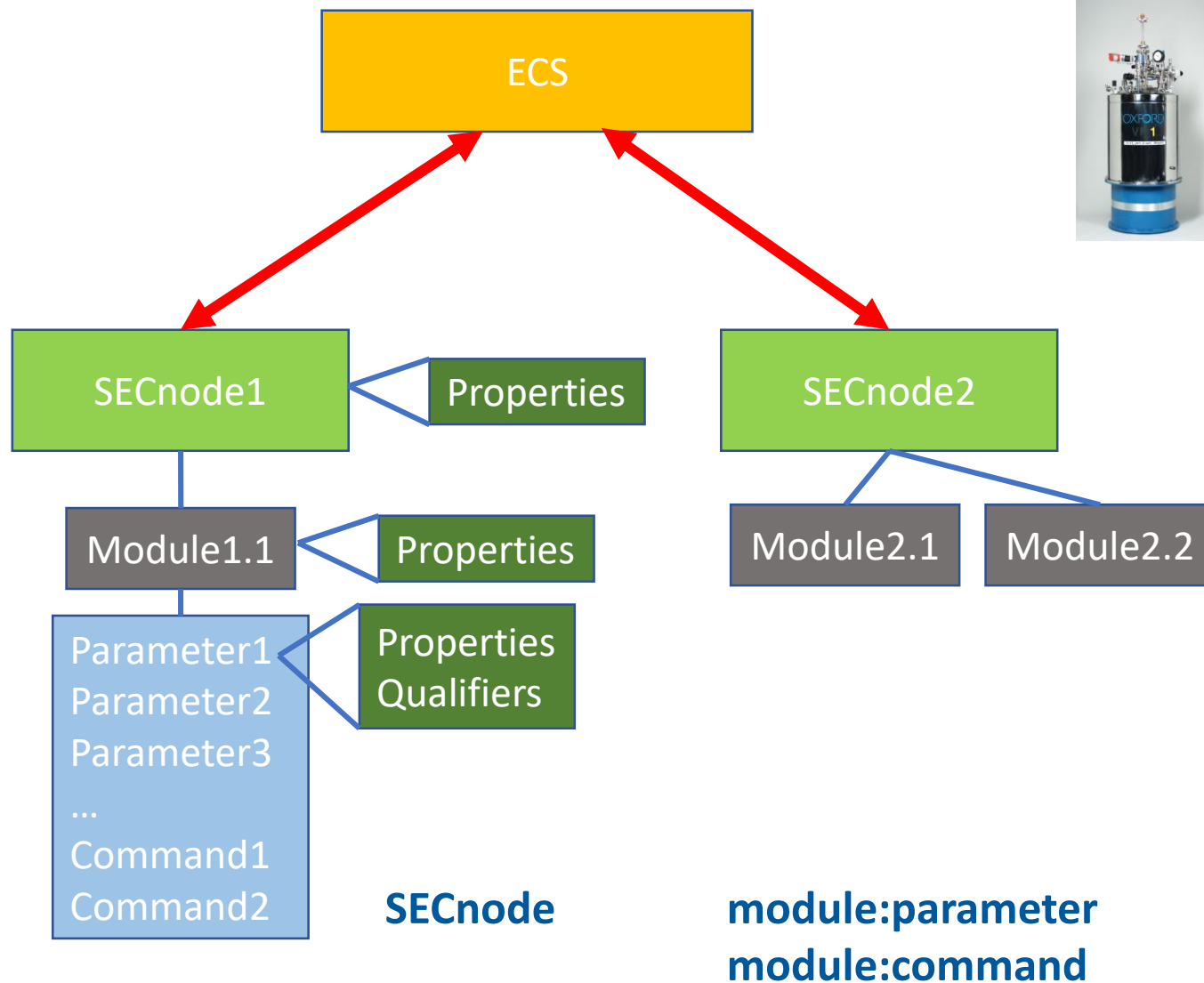


SECoP structure

SECoP Structure



SECoP Structure



SENode (VM-1)

- temperature (module)
 - value (parameter)
 - target
 - status

- magneticfield
 - value
 - target
 - ramp
 - status
 - stop (command)

- heliumlevel
 - value
 - status

SECoP messages: examples

read request	request reply	read reply	<i>module:parameter module:parameter value</i>
change value	request reply	change changed	<i>module:parameter value module:parameter value</i>

```
> read temp1:value  
< reply temp1:value [295.13, {"t":1505396348.188}]  
  
> change temp1:target 295  
< changed temp1:target [300, { "t":1505396349.123}]
```

SECoP messages: examples

description

request
reply

describe
describing *SEC-node-id description*

```
> describe
< describing .
{
  "description": "TestNode",
  "equipment_id": "HZB_Testnode1",
  "firmware": "SHALL server library (Git 70591a14f66f37b92dcf6386a17159b526fa2913)",
  "modules":
  {
    "templ":
    {
      "interface_classes": ["Writable", "Readable"],
      "description": "a meaningful description of the module",
      "accessibles":
      {
        "value":
        {
          "description": "temperature",
          "datainfo": {"type": "double", "unit": "K"},
          "readonly": true
        },
        "target":
        {
          "description": "target temperature",
          "datainfo": {"type": "double", "unit": "K"},
          "readonly": false
        }
      }
    }
  }
}
```

SECoP messages: examples

description

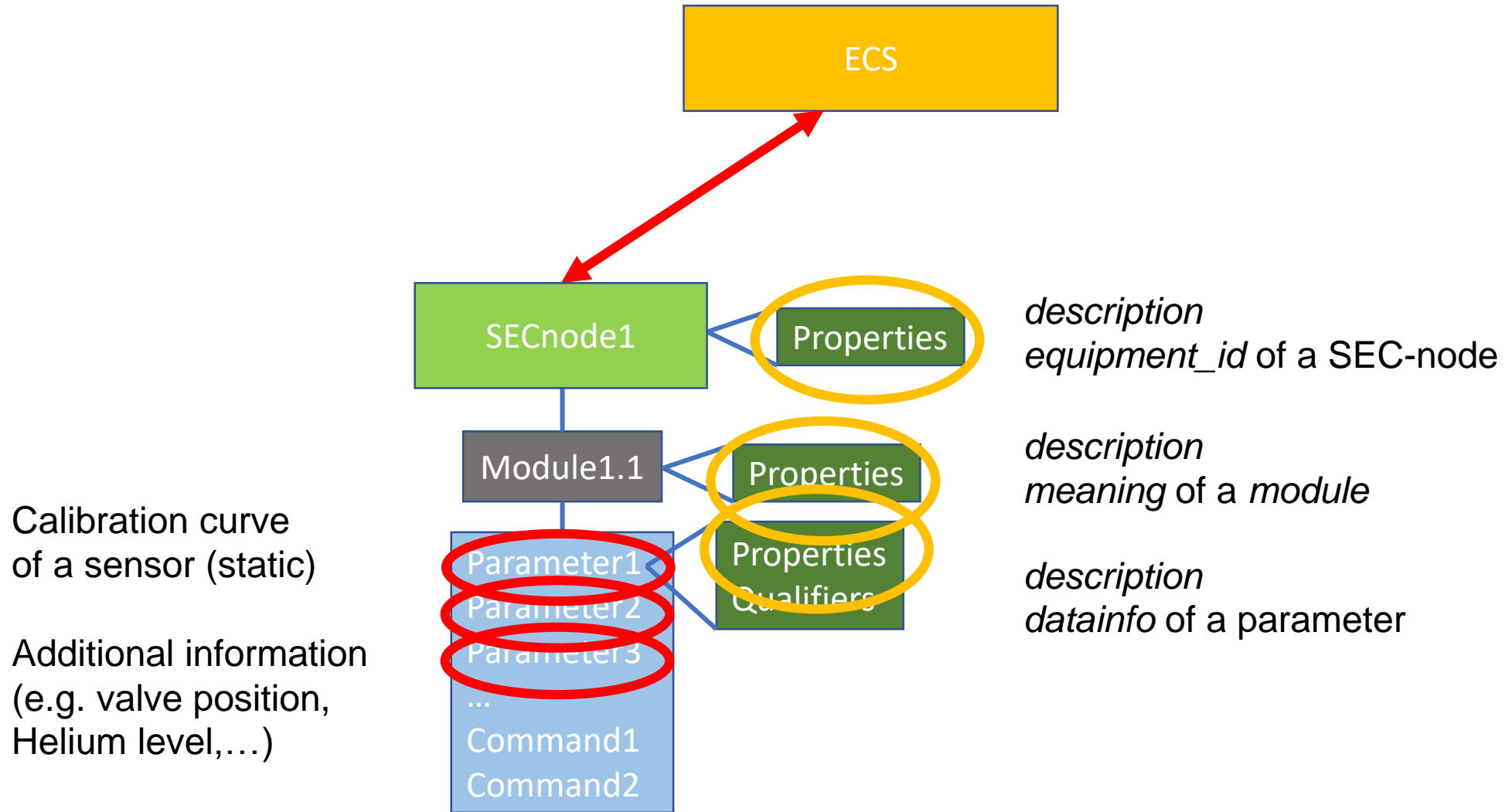
request
reply

describe
describing *SEC-node-id* description

```
"status":
{
  "description": "module status",
  "datainfo":
  {
    "type": "tuple",
    "members":
    [
      {
        "type": "enum",
        "members": {"DISABLED": 0, "IDLE": 100,
                  "WARN": 200, "BUSY": 300,
                  "STABILIZING": 380, "ERROR": 400}
      },
      {
        "type": "string"
      }
    ]
  },
  "readonly": true
}
```

Metadata in *SECoP*

Metadata in SECoP



Metadata plug&play

Predefined parameters

- value, status, target, ramp, ...

Interface classes

- Readable, Writable, Drivable
- complex interface classes

Module property „meaning“

- **meaning (tuple, optional)**

- "temperature" (the sample temperature)
- "temperature_regulation" (to be specified only if different from 'temperature')
- "magneticfield"
- "electricfield"
- "pressure"
- "rotation_z" (counter clockwise when looked at 'from sky to earth')
- "humidity"
- "viscosity"
- "flowrate"
- "concentration"

SECoP@<HMC>
Project structure

Work packages

WP1: Standards for Sample Environment metadata in SECoP (K. Kiefer, HZB)

WP2: Standards for storage of Sample Environment metadata (T. Kracht, DESY)

WP3: Implementation into experimental control systems (G. Brandl, FZJ)

WP4: Outreach, Dissemination & Training (T. Herrmannsdörfer, HZDR)

How can HMC support

SECoP@HMC

to be successful?

How can HMC support?

WP1: Standards for Sample Environment metadata in SECoP

- Completeness of the metadata information
- Feedback from HMC experts
- Links to other projects, user groups, other scientific fields

WP2: Standards for storage of Sample Environment metadata

- Mapping to a unified SE vocabulary / existing standards
- Feedback from HMC experts

WP3: Implementation into experimental control systems

- Test implementations at other facilities
- Feedback

WP4: Outreach, Dissemination & Training

- Visibility
- Outreach to other scientific fields
- Establishing SECoP as a control standard including metadata

Where do you see the linkage to HMC and how do you plan to integrate your project results?

Linkage and integration of project results

- **Direct contact to experts**
- **Invitation to SECoP@HMC WP meetings**
- **HMC events, HMC Friday**
- **Asking for feedback at specific points during the project**
- **Presentation of project results**
- **Dissemination over HMC platform**

Thank You