EPICS Version 4 Services

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Thanks Steve and Steve

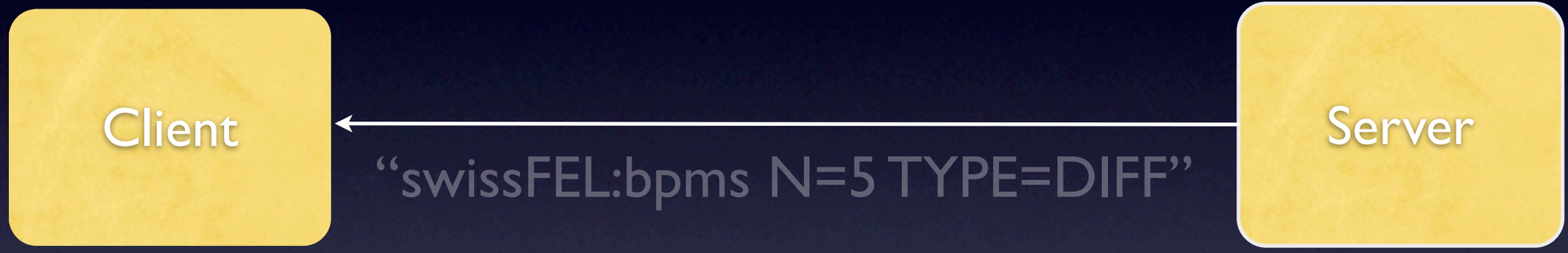
Services Need

1. Arguments
2. Structured Data

V4 Support for Services

Arguments

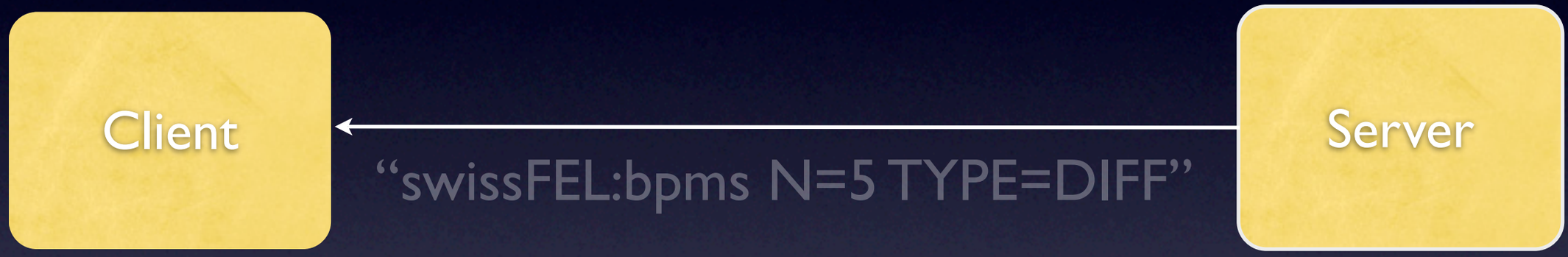
Structures




```
structure orbitData {
    float: x
    float: xrms
    float: y
    float: yrms
    double: tmit
    severity: sev
}
```

```
structure orbitData {
    float: x
    float: xrms
    float: y
    float: yrms
    double: tmit
    severity: sev
}
```

pvData = data definition and management

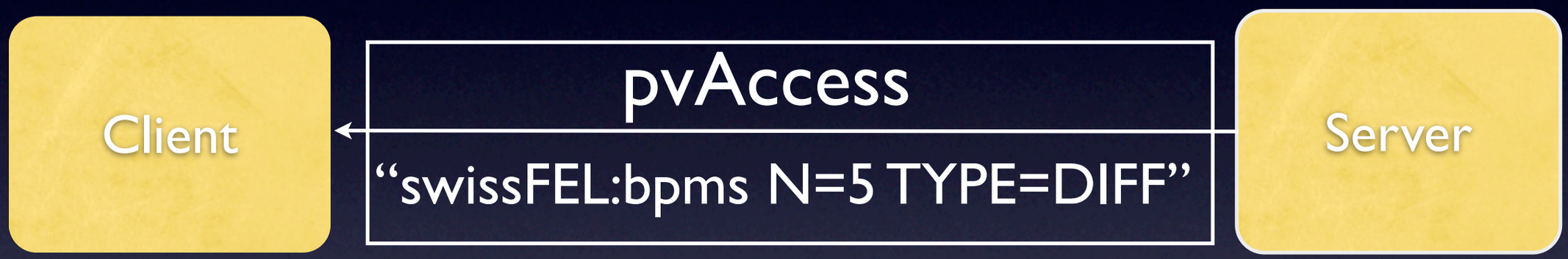


structure orbitData {
float: x
float: xrms
float: y
float: yrms
double: tmit
severity: sev
}

structure orbitData {
float: x
float: xrms
float: y
float: yrms
double: tmit
severity: sev
}

pvData

pvAccess = ca + pvData

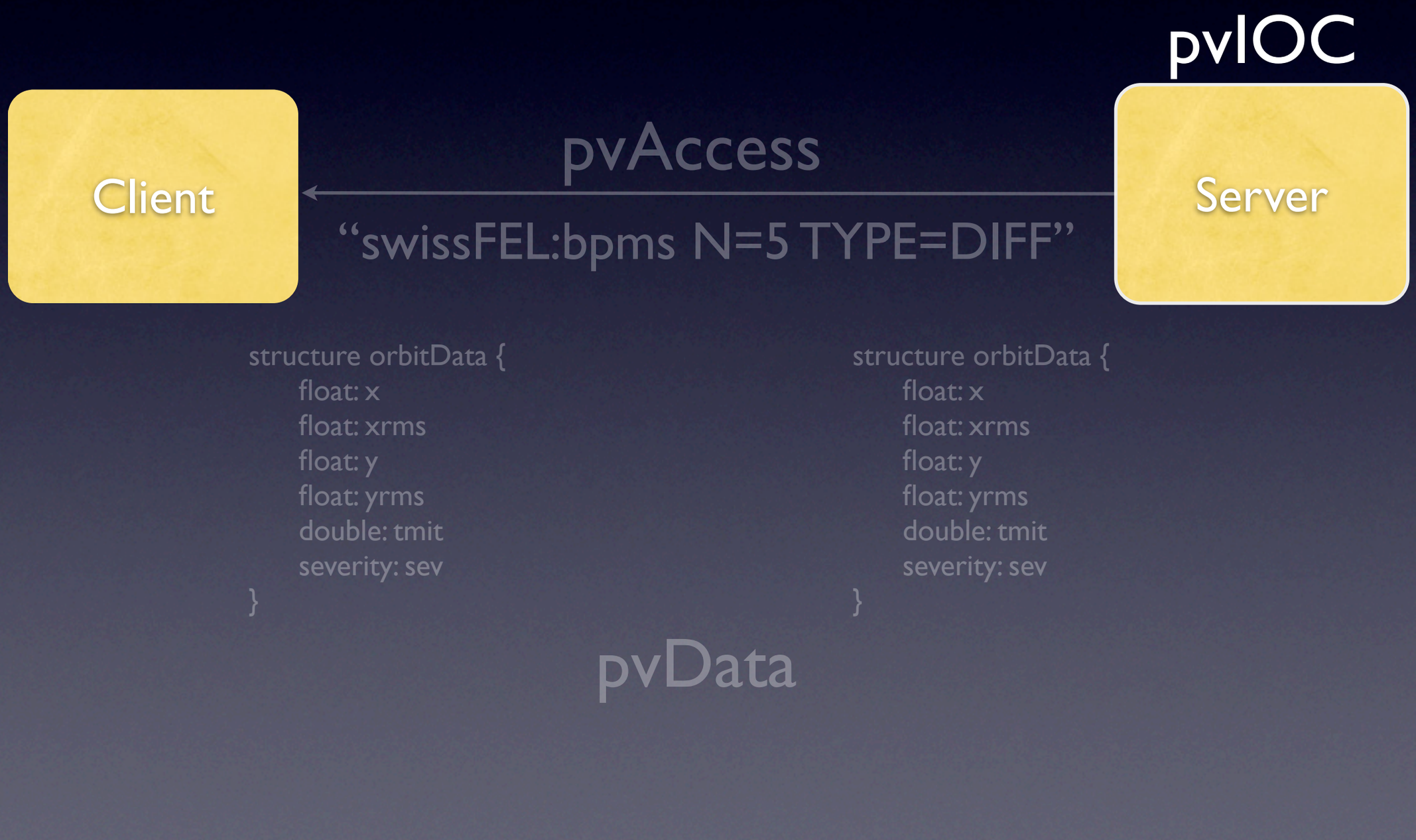



```
structure orbitData {
    float: x
    float: xrms
    float: y
    float: yrms
    double: tmit
    severity: sev
}
```

```
structure orbitData {
    float: x
    float: xrms
    float: y
    float: yrms
    double: tmit
    severity: sev
}
```

pvData

pvIOC = IOC


pvIOC
Client
pvAccess
“swissFEL:bpms N=5 TYPE=DIFF”
Server
structure orbitData {
float: x
float: xrms
float: y
float: yrms
double: tmit
severity: sev
}
structure orbitData {
float: x
float: xrms
float: y
float: yrms
double: tmit
severity: sev
}
pvData

pvService = RPC

pvService

pvService

pvIOC

Client

Server

pvAccess

“swissFEL:bpms N=5 TYPE=DIFF”

```
structure orbitData {
    float: x
    float: xrms
    float: y
    float: yrms
    double: tmit
    severity: sev
}
```

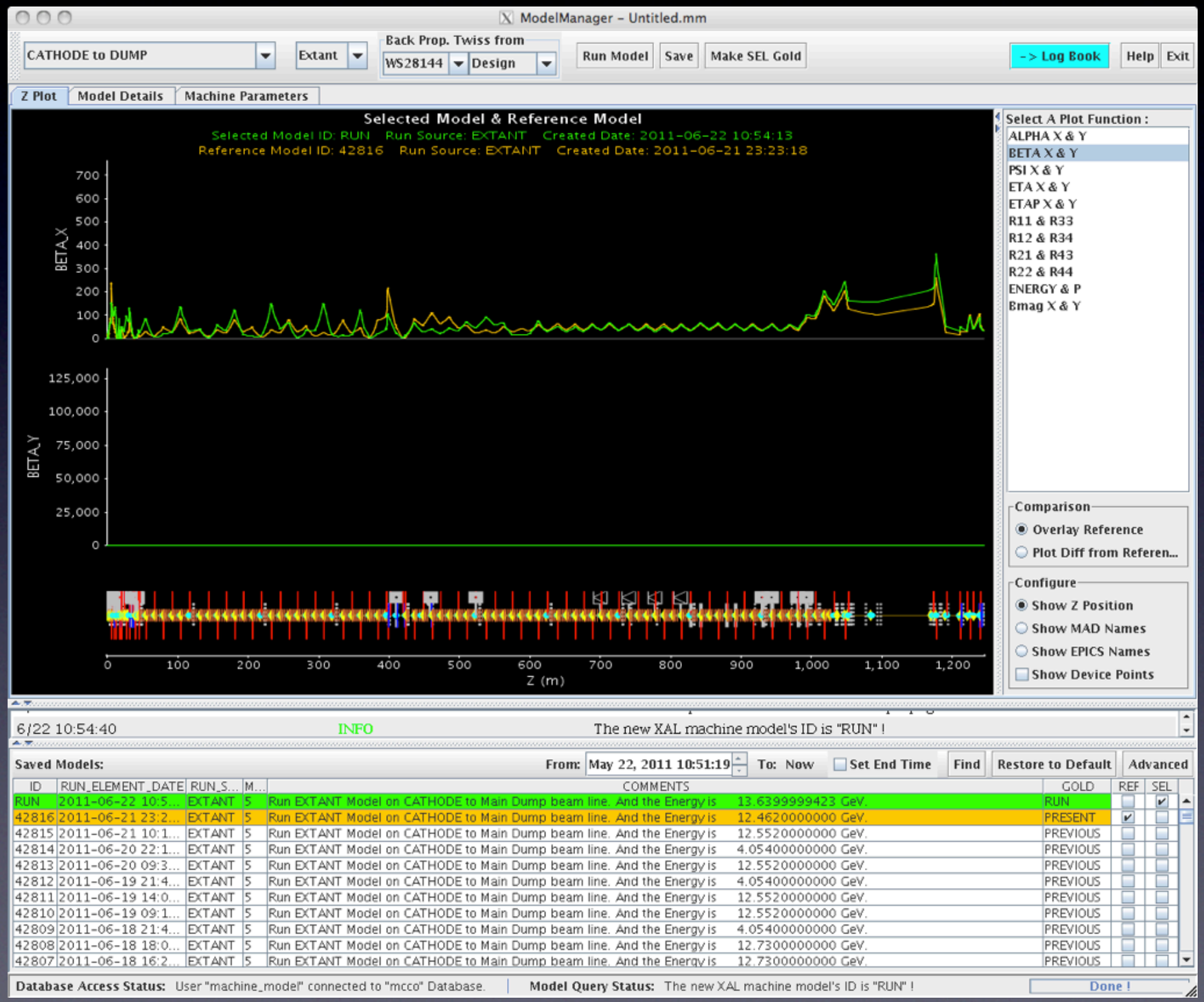
```
structure orbitData {
    float: x
    float: xrms
    float: y
    float: yrms
    double: tmit
    severity: sev
}
```

pvData

“Specific Services”

- Model Service. Twiss parameters, R matrix
  - MAD (PSI), Tracy, Elegant, XAL etc
- BPM Orbit Service (pulse synchronous get)
- Magnet service (coordinated set)
- Linac Energy Management (energy profile meas and calc -> lattice correction).

Model Computation



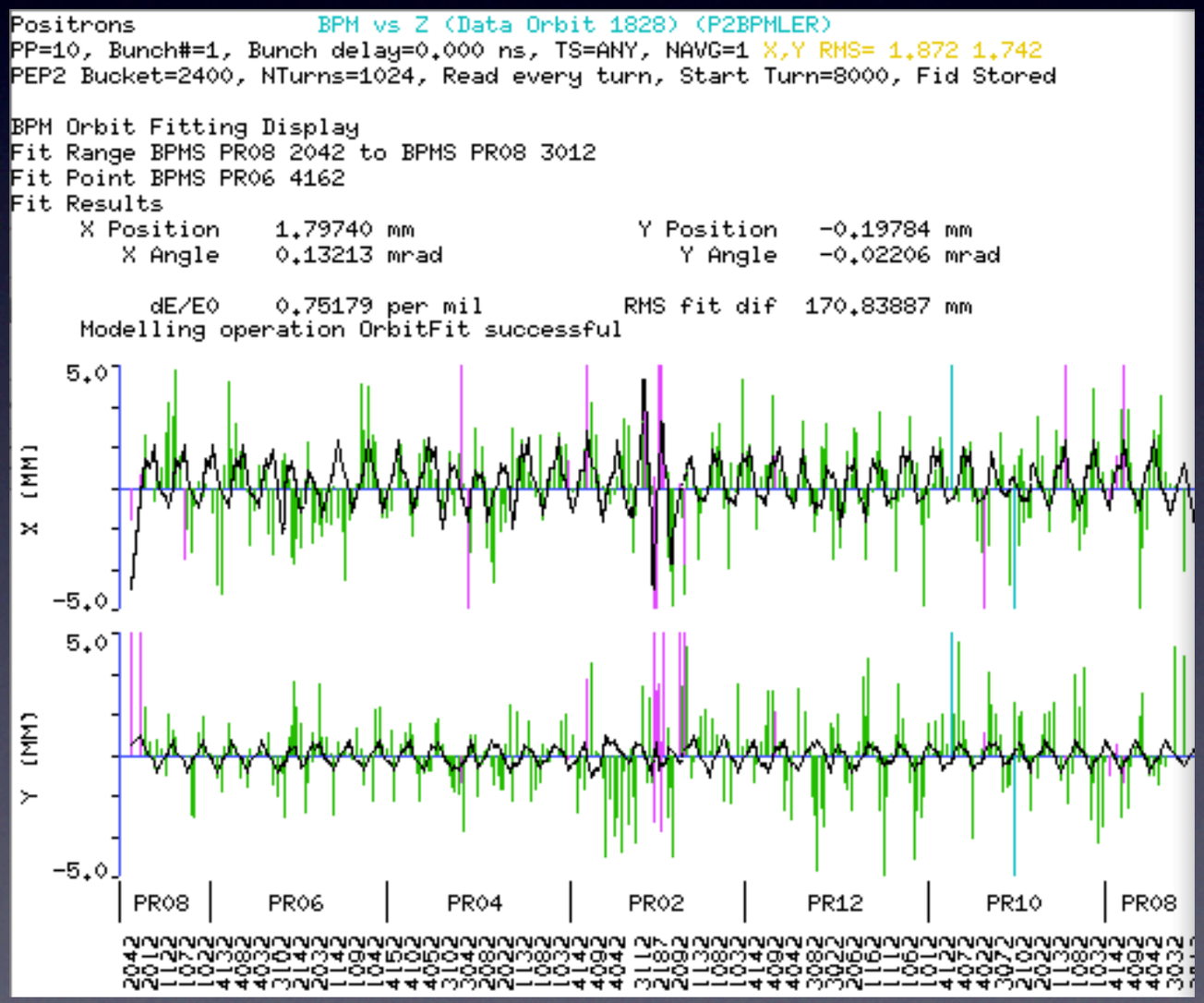
Model Data Example

So called “R-matrix” - the basic building block of emittance optimisation.

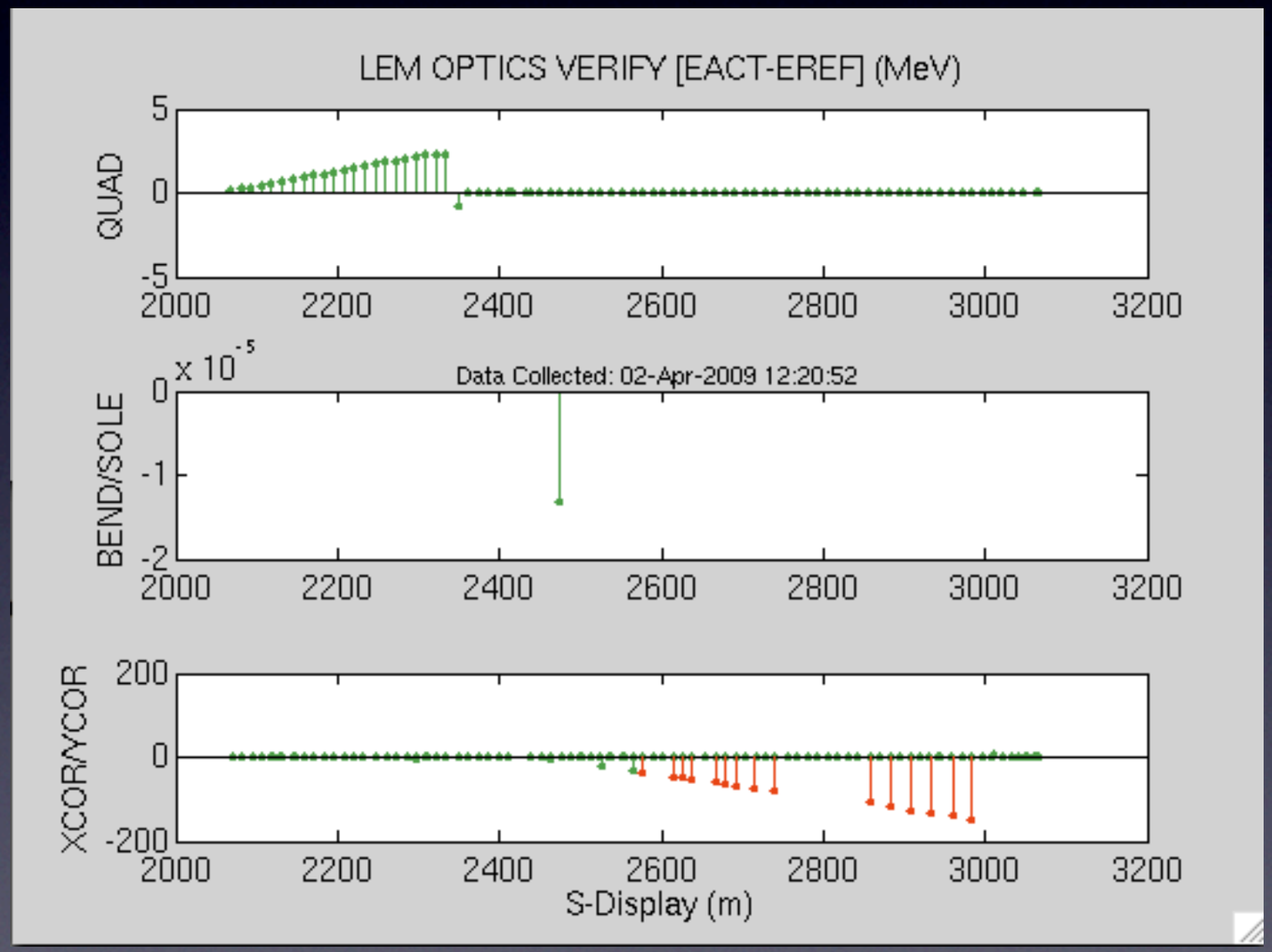
```
> pvget QUAD:LI21:271/R -o TYPE=DESIGN -o POS=MID -o RUN=LATEST
        0.23     0.1234  0.0      0.0      0.067562 0.001167
    -0.34520   0.0923   0.0      0.0      0.046981 0.001514
       0.0       0.0     1.881007  4.857304 0.0      0.0
       0.0       0.0    -1.50064  -3.862346 0.0      0.0
    -0.00132  -0.001129 0.0      0.0      0.224701 0.003894
     0.162595  0.10285  0.0      0.0    -19.603   -0.233109
```

BPM Orbit Service

All BPMs' x,y offset, beam synchronous, plus fitting



Linac Energy Management (LEM)



Conclusions

- Service low level support is ready to use
- Now making it easy to use
  - Normative types and helpers
- Model service for SwissFEL this year