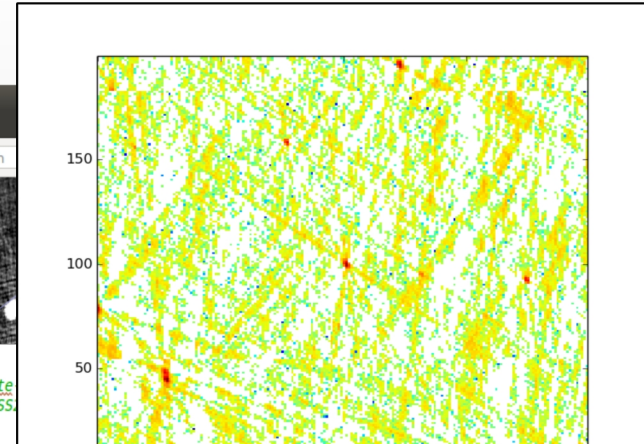
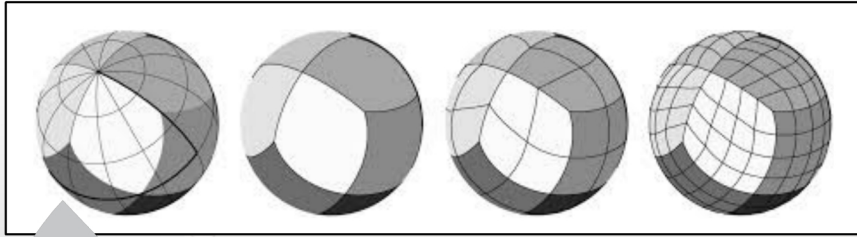


# KDIG Thursday May 18 / 09:00-10:30, Room E



KDIG 1: Implementations and Operational Issues (Thursday May 18: 09:00-10:30, Room E)			
Speaker	Title	Time	Materials
Kai Polsterer	presentation and discussion of new charta	10'+10'	<a href="#">KD-IG</a>
discussion of request of definition/modification/extension/implementation of IVOA standards w.r.t.			
all	polymorphic data access ( <a href="#">HiPS</a> , Registry)	15'	
all	time domain astronomy (Time Domain, Applications)	15'	
all	uncertainty quantification and probabilistic evaluation (Applications/Data Modeling)	15'	
all	remote execution of machine learning models (Grid and Web Services/Applications/Data Modeling)	15'	
all	conclusion / discussion / future work	10'	

# Polymorphic Data Access



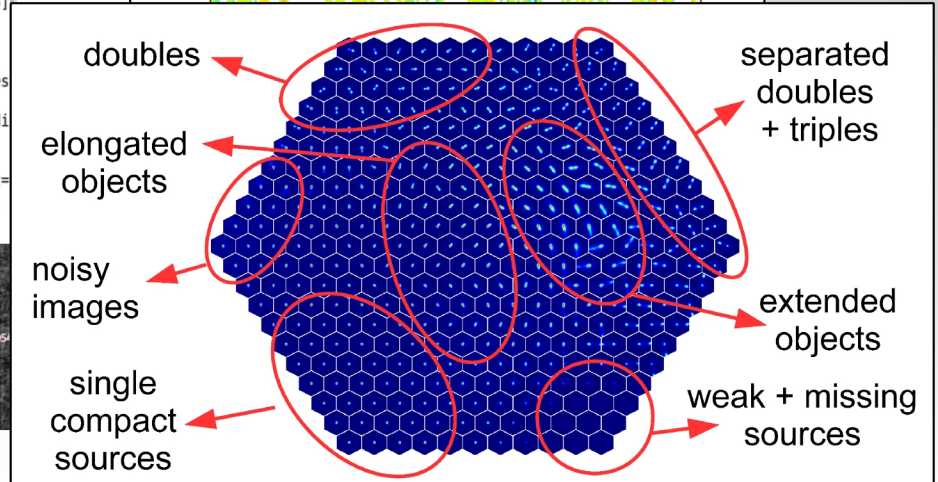
J2000 23 31 7.416 -54 54 31.56

**Base image layer**  
WTF  
Color map: nati Reverse

**Overlay layers**  
 Reticle  
 HEALPix grid

**Tools**  
Export view as PNG

```
230 if __name__ == "__main__":  
231     surveyAddress = "atlas-spt-hips-2.s3-website  
232     surveyAddress = "alasky.u-strasbg.fr/DSS/DSS  
233  
234     coordinate = [350.86, -55.225]  
235     size = [200, 200]  
236     resolution = 0.002  
237  
238     myHiPSfs = HiPSfs(surveyAddress  
239  
240     image = myHiPSfs.extractCoordi  
241  
242     pyplot.figure()  
243     pyplot.imshow(image, aspect=  
244     pyplot.gca().invert_yaxis()  
245     pyplot.show()
```



# Polymorphic Data Access



use-case defines the format

- images / spectra / features
- pre-processing / cutout

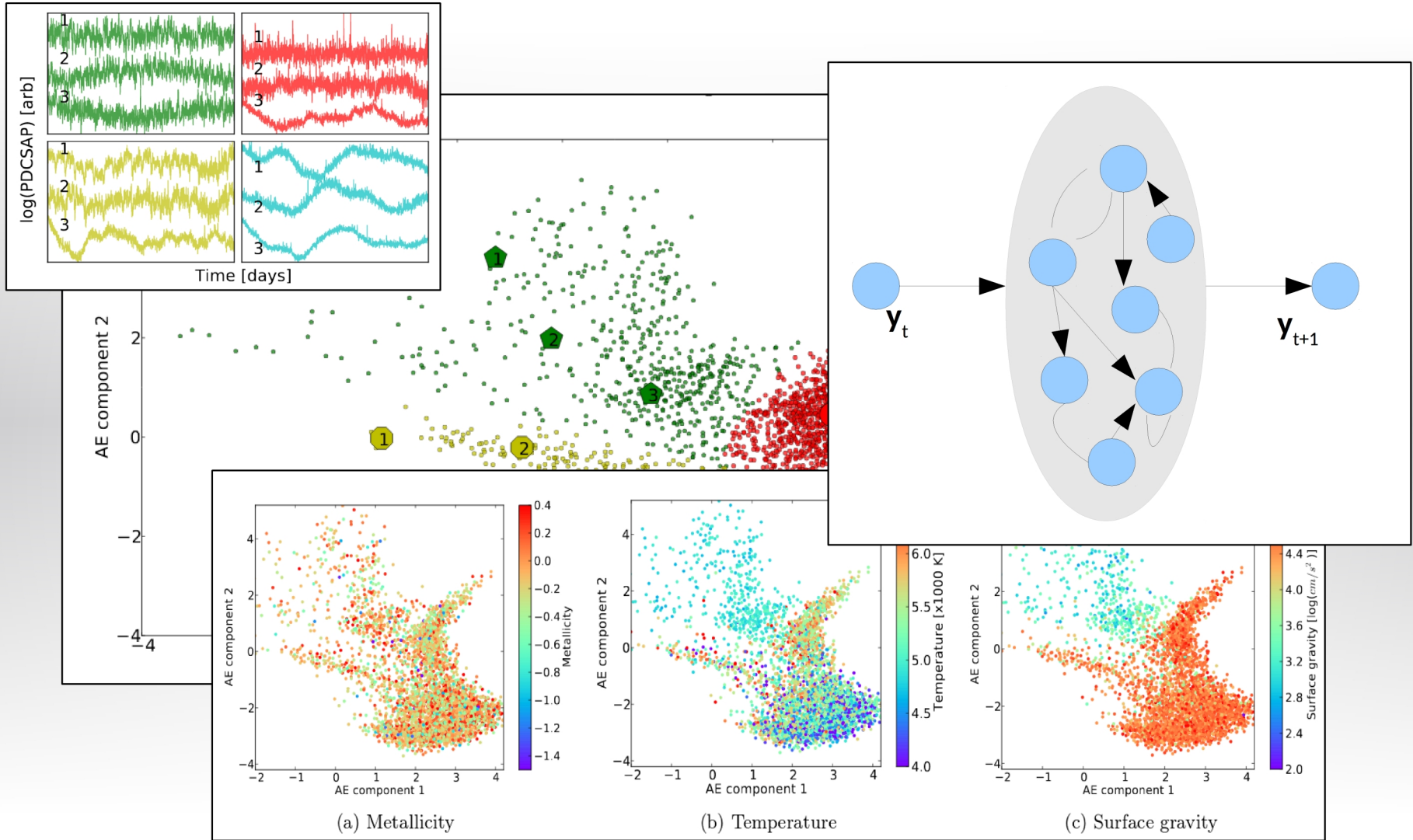
polystructured databases

- spatial / spectral / temporal hierarchies
- semistructured data (MOC/XML)
- unstructured data (text)

meta-data / provenance

- delivered with the result

# Time Domain



# Time Domain

description of time / semantics

- vocabulary for temporal behavior
- generative models / shapelets / prototypes / templates

alerts / triggers / meta-data

- how to define an alert?
- machine learning triggers / description

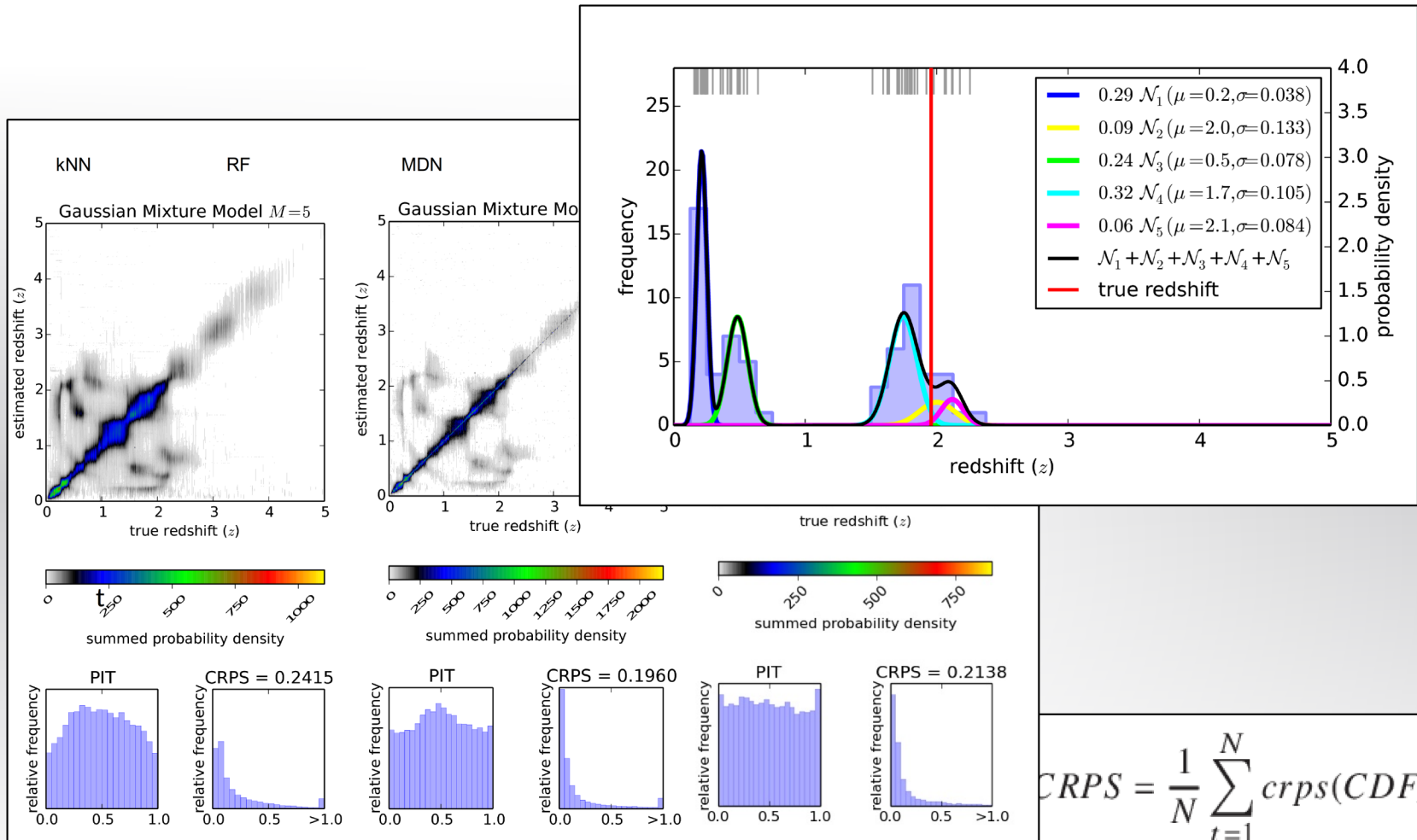
streams / online-learning

- feedback mechanism
- branching / provenance / reproducibility

visualization of the time domain

- plots / movies / comparison

# Probabilistic Data



$$CRPS = \frac{1}{N} \sum_{t=1}^N crps(CDF_t, z_t),$$

$$\text{with } crps(CDF_t, z_t) = \int_{-\infty}^{+\infty} [CDF_t(z) - CDF_{z_t}(z)]^2 dz$$

# Probabilistic Data



preservation of probabilities / probabilistic representation

- simple probabilities
- full probability density distributions / likelihoods
- mixture density model

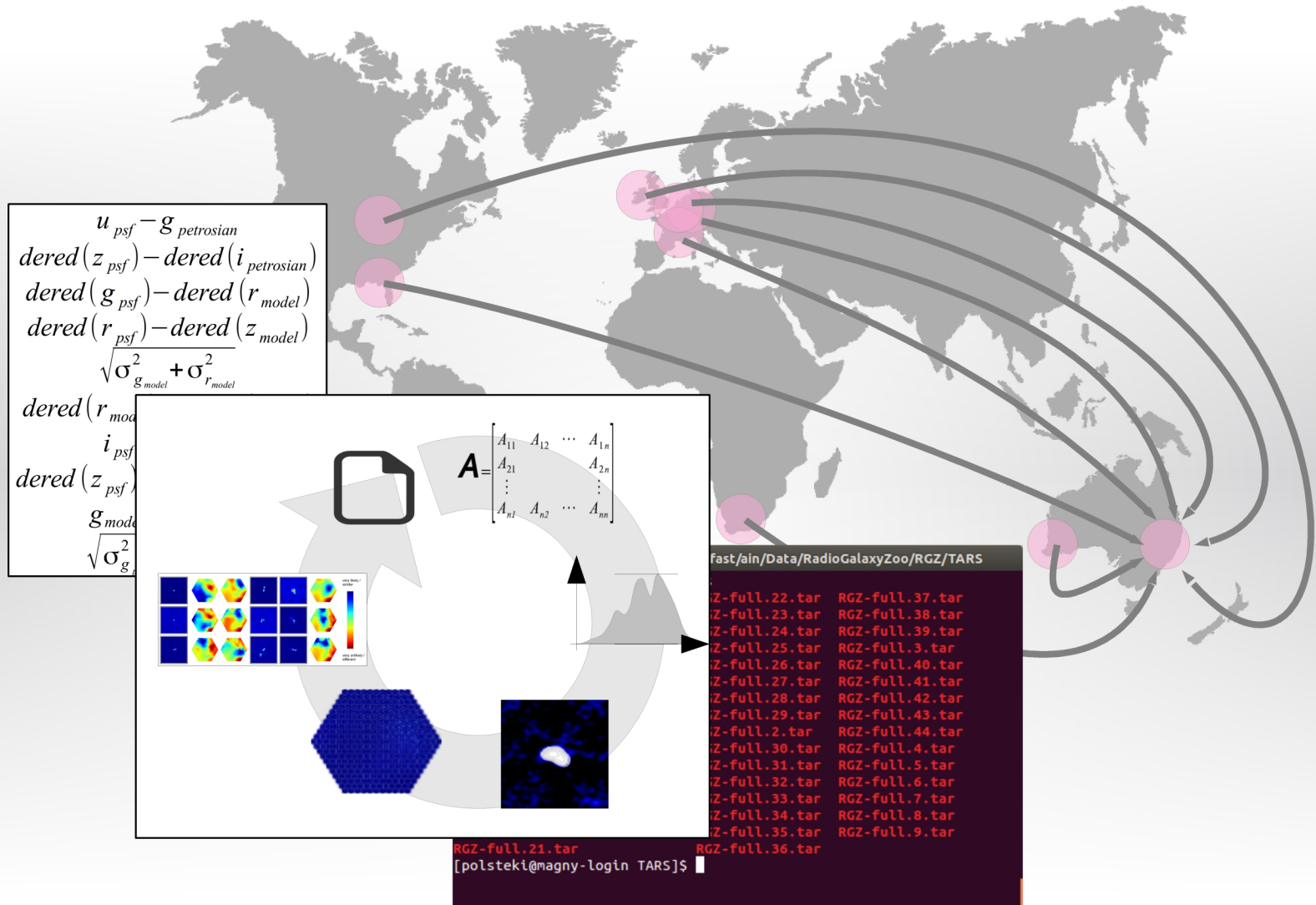
user access to uncertainty

- change of database access / ADQL
- propagating uncertainties

proper statistical tools

- ensure the use of proper scores and tools
- provide meta-data for publication

# Remote Execution





# Remote Execution



transfer of models

- code / container
- hyper-parameters / reference data

provenance / meta-data / results

- preservation / versioning
- training / testing data / streams?

feedback

- update of model / reference data
- online-learning / reinforcement-learning / active-learning