A Material Assay Database

for the Low Background Physics Community

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Current status

- First prototype tested at the LBNL LBF
- Presentation and discussion at March AARM meeting

    - slides available on wiki

- Second prototype under development :

    - lbf.lbl.gov/demo (username & password ‘aarm’)

lbf.lbl.gov/demo

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- Homestake mine, rhyolite dike rock, 1250L
- Homestake mine, rhyolite dike rock, 4100L

Sample	Description	HST-17, rhyolite dike at 4100L (near Yates Shaft), 4/09
	Source	Homestake mine
	Owner	LBNL
	Tags	Homestake samples
	Geometry	S6MB annulus
Measurement	Technique	Gamma
	Institution	LBNL
	Date	4 / 2009
	Requestor	n/a (n/a)
	Practitioner	Al Smith (ARSmith@lbl.gov)
	Description	This document summarizes measurements made at the Lawrence Berkeley National Laboratory (LBNL) Low Background Facility (LBF) in preparation for converting the Homestake Mine facilities into a deep underground experimental facility for the Nuclear Sciences. All analyses have been performed using a high-resolution HPGe detector gamma-ray spectrometer, to identify and quantify all gamma-emitters in sample materials. Except for surface samples which may contain radionuclides from mid 20th century atmospheric nuclear weapons testing, the gamma-emitters of significance are the natural terrestrial radionuclides (U,Th,K): the uranium series, the thorium series, and potassium. The following list summarizes results obtained from bulk samples collected from the underground workings of the mine as these areas have become accessible, starting in September 2007.
	Count length	18000 sec
	Data file	23832
	Detector	MERLIN(BKY)
	Results	U(early) 9.53 (0.12) ppm U(late) 8.57 (0.05) ppm Th 11.4 (0.1) ppm K 7.60 (0.02) pct Eman 10 pct
Data	Reference	HOMESTAKE4-Concrete.doc
	Entry by	James Loach (jcloach@lbl.gov)

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Sample

Name	Brief description
Description	Detailed description
Source	
Owner	
Tags	Tags separated by spaces
Mass	
Geometry	

Measurement

Technique	
Institution	Where it was counted
Date	mm/dd/yyyy
Requester	Name / Email or institution
Practitioner	Name / Email or institution
Description	Detailed description

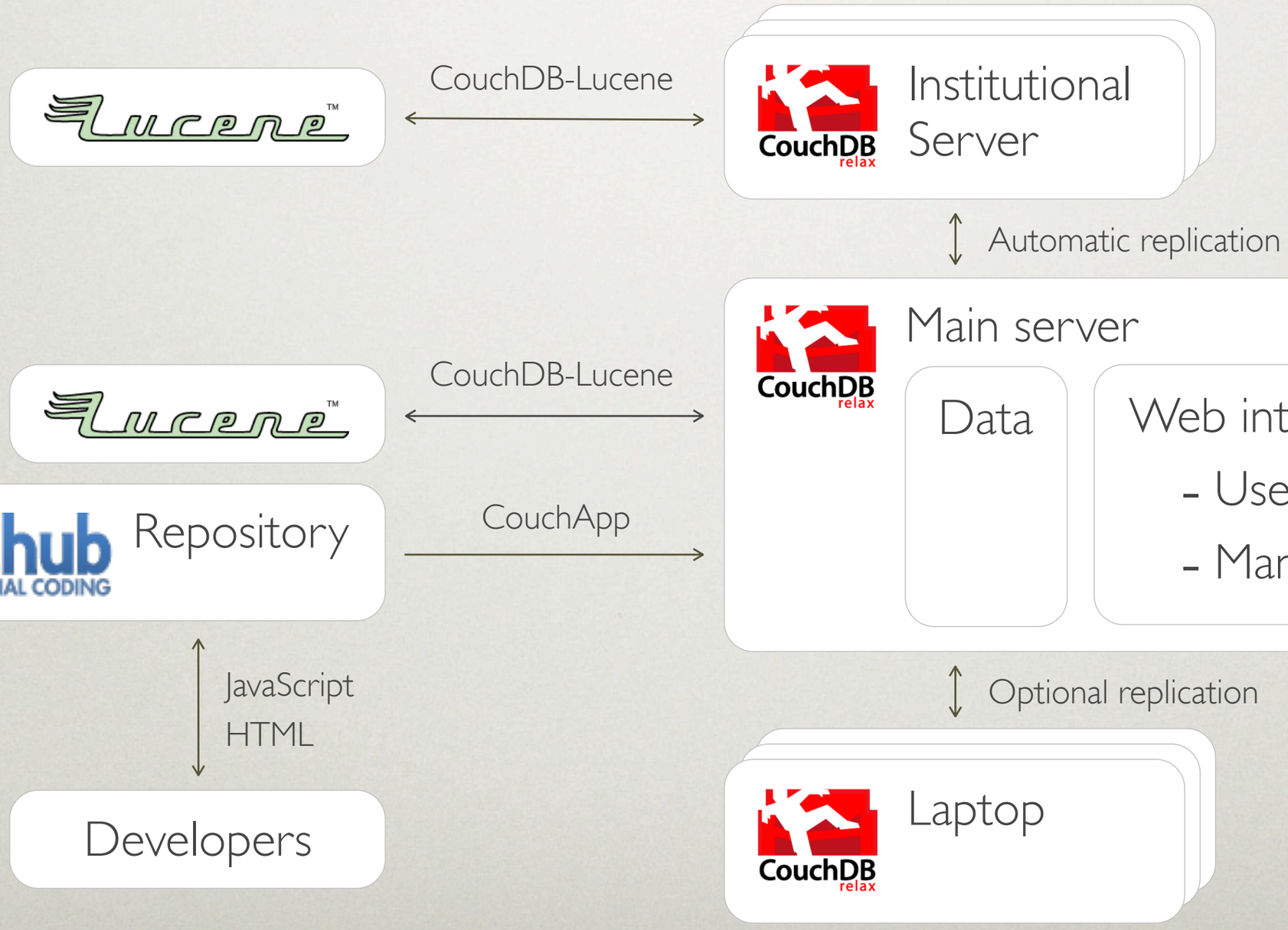
The software

Key features

- Freely extendable data structure based on MADF core
- Powerful search
- Software resident inside the database
- High data portability
- Open source

The software

Structure



The software

JSON Material Assay Data Format (MADF)

```
{
   "type":           "measurement",

   "sample":         { },
   "measurement":    { },
   "data_source":    { }

}
```

```
"sample": {

   "name":                    "",
   "description":             "",
   "source":                  "",
   "owner":                   "",
   "tags":                  ["", “”, “”, ... ]

}
```

```
"data_source": {

   "reference":               "",
   "data_entry_name":         "",
   "data_entry_contact":      ""

}
```

```
"measurement": {

   "institution":             "",
   "technique":               "",
   "date":                 { "day":"", "month":"", "year":"" },
   "requestor":               "",
   "requestor_contact":       "",
   "practitioner":            "",
   "practitioner_contact":    "",
   "description":             "",
   "results": [
      { "isotope":"", "value":"",  "error":"", "unit":"" },
      { "isotope":"", "limit":"",  "c.l.":"",  "unit":"" }
   ]

}
```

Outstanding tasks

Important **coding** tasks

- Formally specify MADF core fields
- Implement full templating
- Isotope & unit constraints
- Management interface, authentication model
- Ability to search without couchdb-lucene
- Website and documentation

Timescale for distribution-quality package: June

Outstanding tasks

Important **administration** tasks

- Solicit collaborators, both users and coders
- Select and import a core data set