HiTI Project
Wire line temperature probe (BRGM Task)

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BRGM RNSC/RSC

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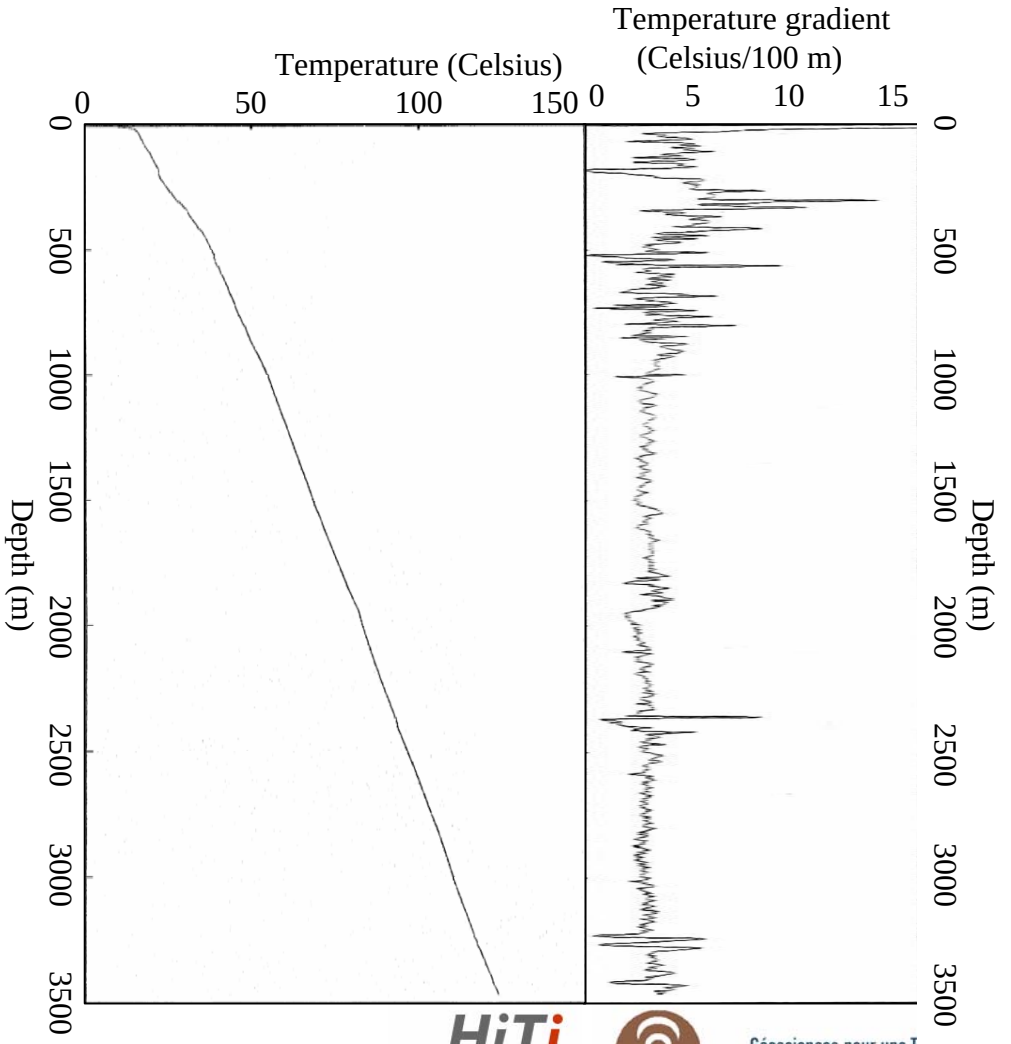
BRGM HiTI Probe – Memento: Engine 2007, Reykjavick



The 90's: R. Gable

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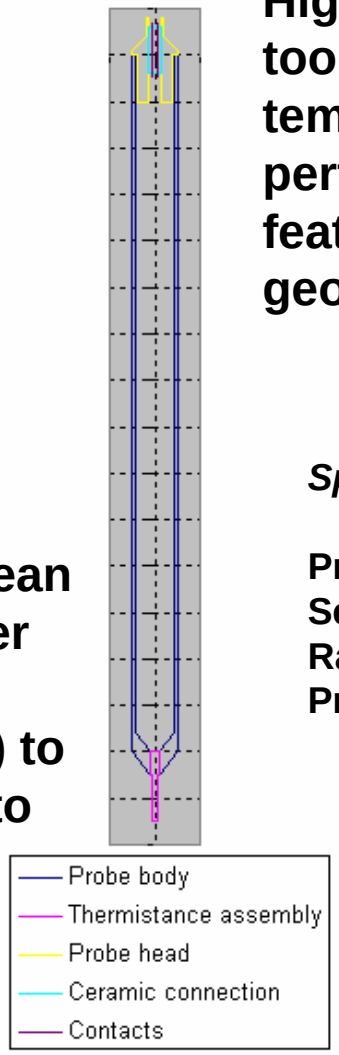
BRGM HiTI Probe – Concept: Engine 2007, Reykjavick

High temperature, High precision temperature measurement probe project

In the framework of the European HITI project, BRGM will transfer his experience from low temperature domain (0-130 °C) to high temperature domain (up to 300 °C)



High precision temperature tools allow accurate temperature logs to be performed and geological features to be characterized in geothermal wells.

Specifications:

Precision:	**0.01°C**
Sensitivity:	**0.003 °C**
Range :	**0 to 300 °C**
Pressure :	**500 bars**

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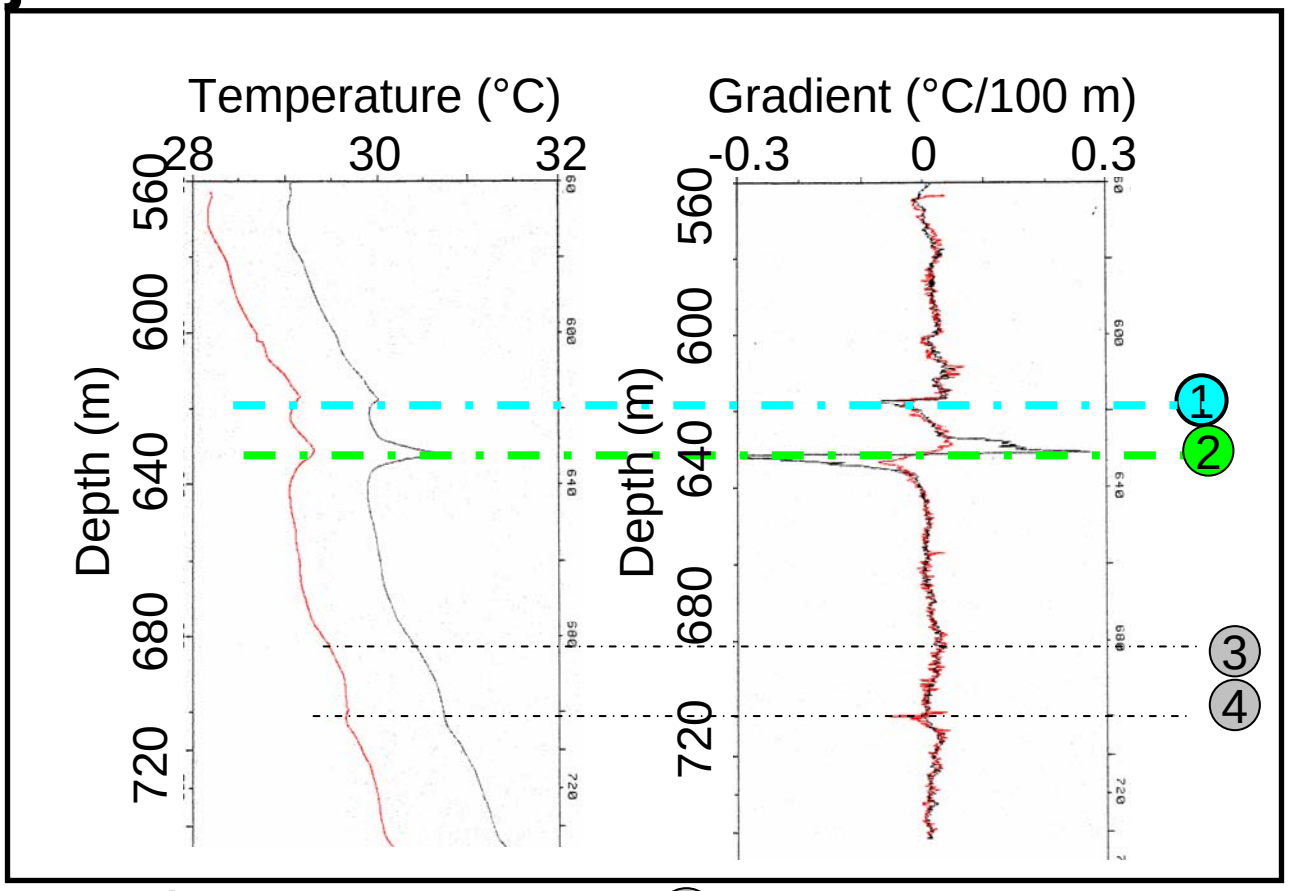

Water flow detection

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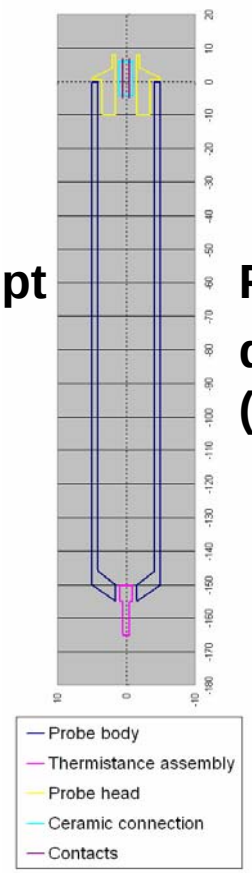
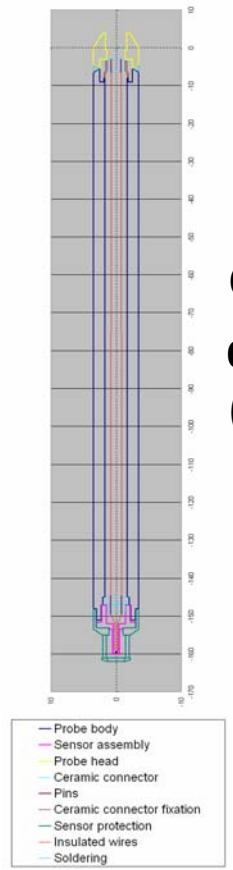
BRGM HiTI Probe – Design and drawings: 2008

Simplest is the best,
Seals are only path for water.

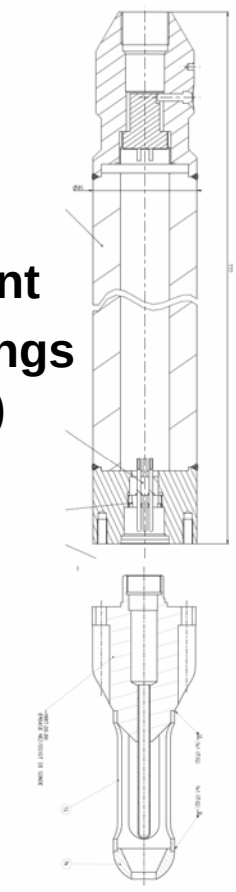
Concept (80's)



First design (2007)



Current drawings (2008)



No electronic inside.

- Corrosive Environment :

H2S : 0.2% to 1%
CO2 : 2% to 15%
Cl : 0.03% to 0.07 %

- Using conditions : 0-300°C 0-500 bars

Substance:
Inconel 625.

Seal: only one

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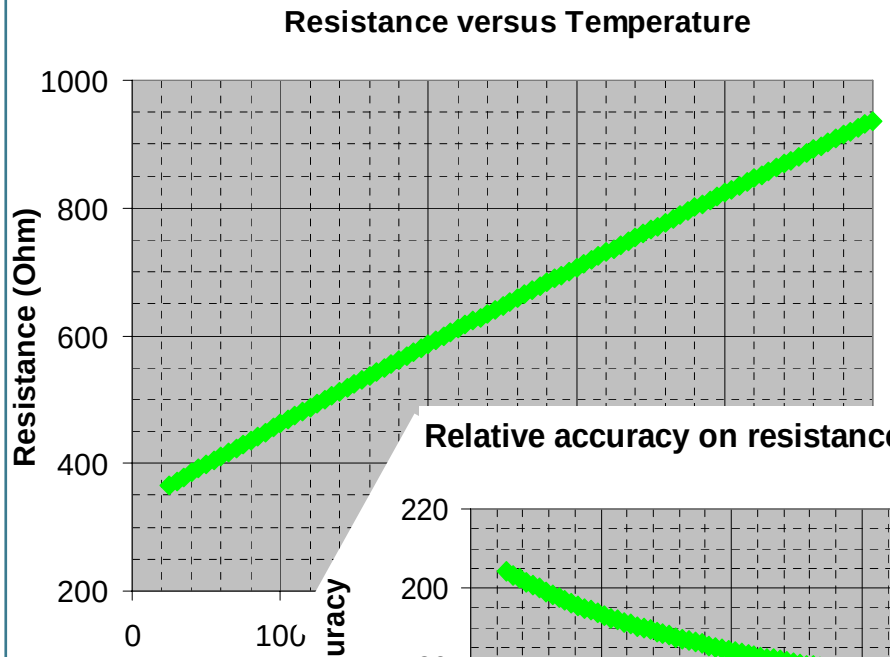
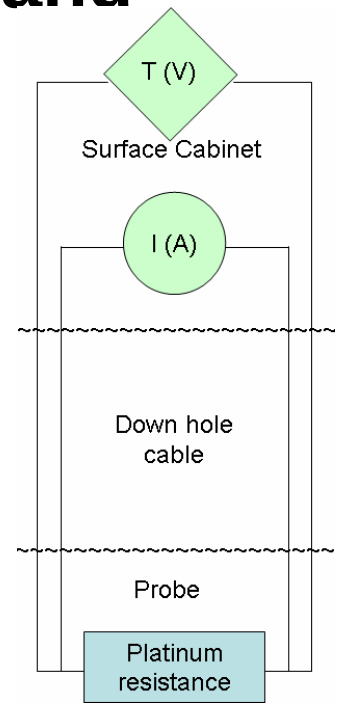
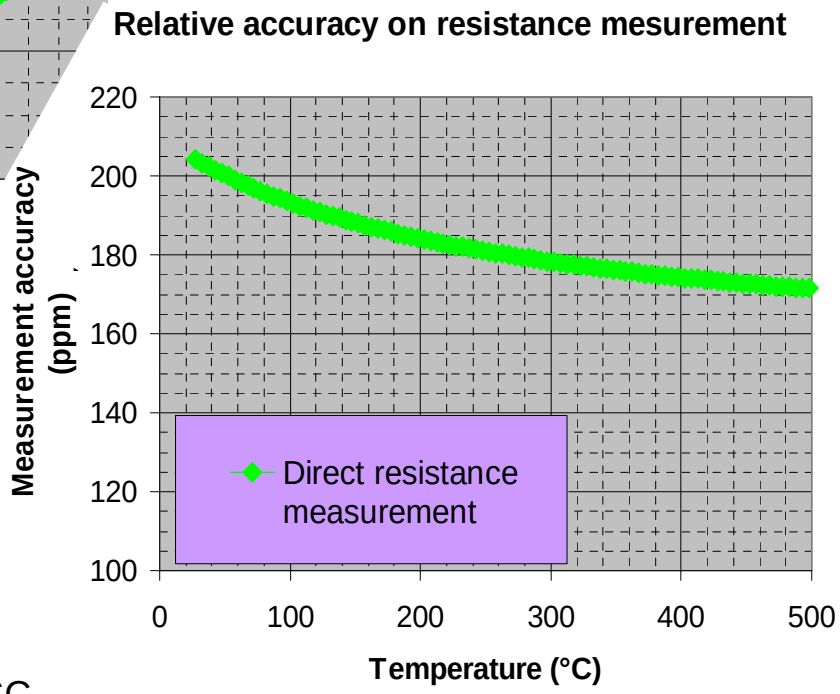
BRGM HiTI Probe – Sensor simulation and choice: 2007-2008



333 Ohm Platinum sensor

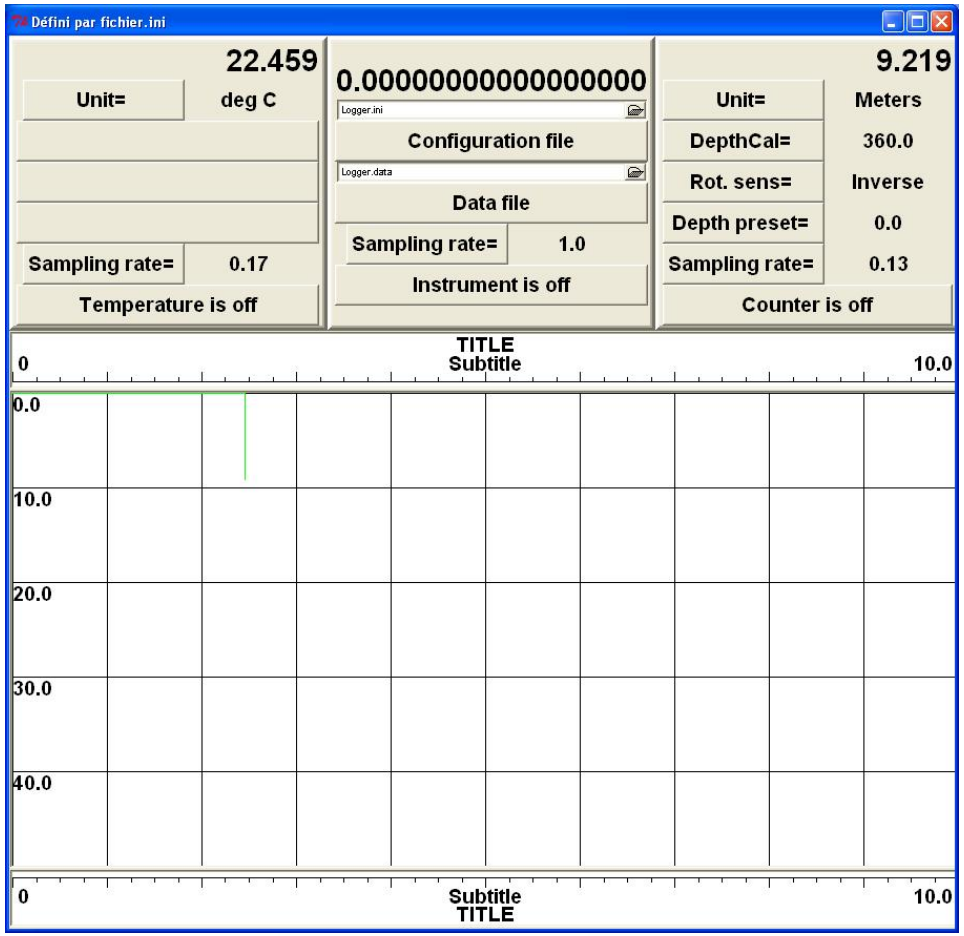




Expected accuracy 0.2 °C

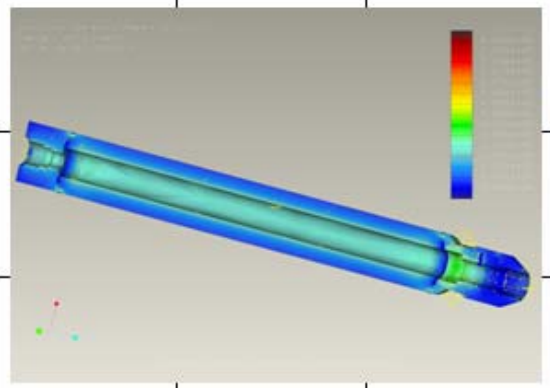
BRGM HiTI Probe – Control software developed with Python (2008-2009):

- Object framework well suited to description of different hardware elements :
- NI counter DAQ Card and Keithley Voltmeter)
- Specifics libraries for instruments control (Py-VISA)
- Easy GUI (Tkinter, Tix)

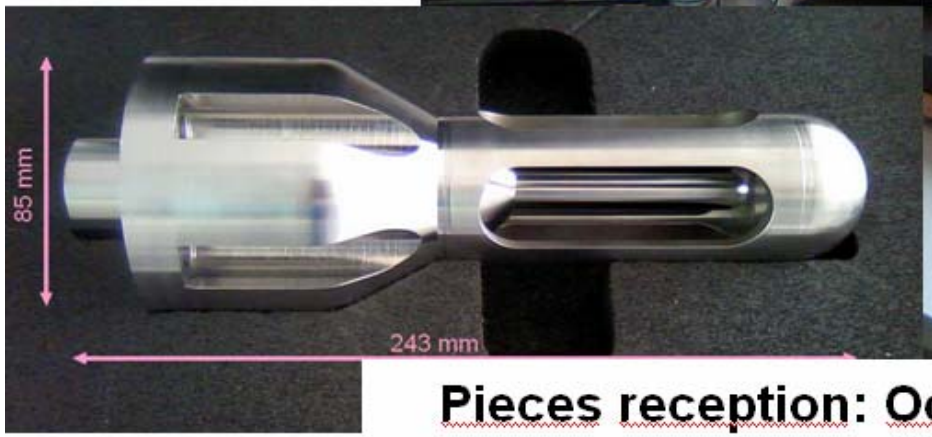


BRGM HiTI Probe – Realization: 2009

	200 °C	300 °C	400 °C
500 bars			
750 bars			
1 000 bars			



Mechanical simulation for confirms design validity: December 2008



Pieces reception: October 2010

First test on desk: January 2010

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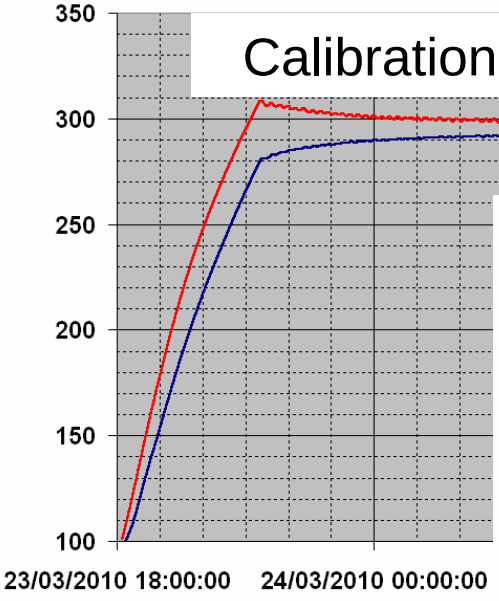
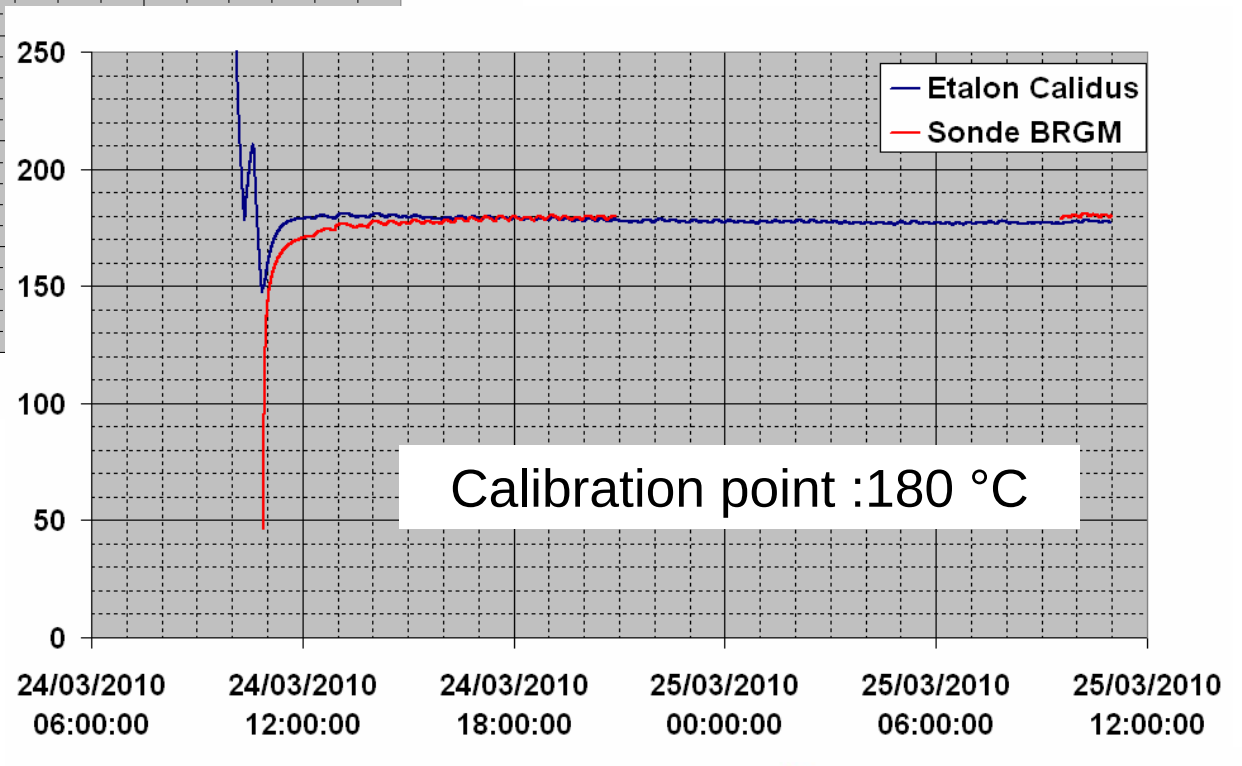
BRGM HiTI Probe – Calibration at Calidus Facilities (Falmouth. UK): March 2010





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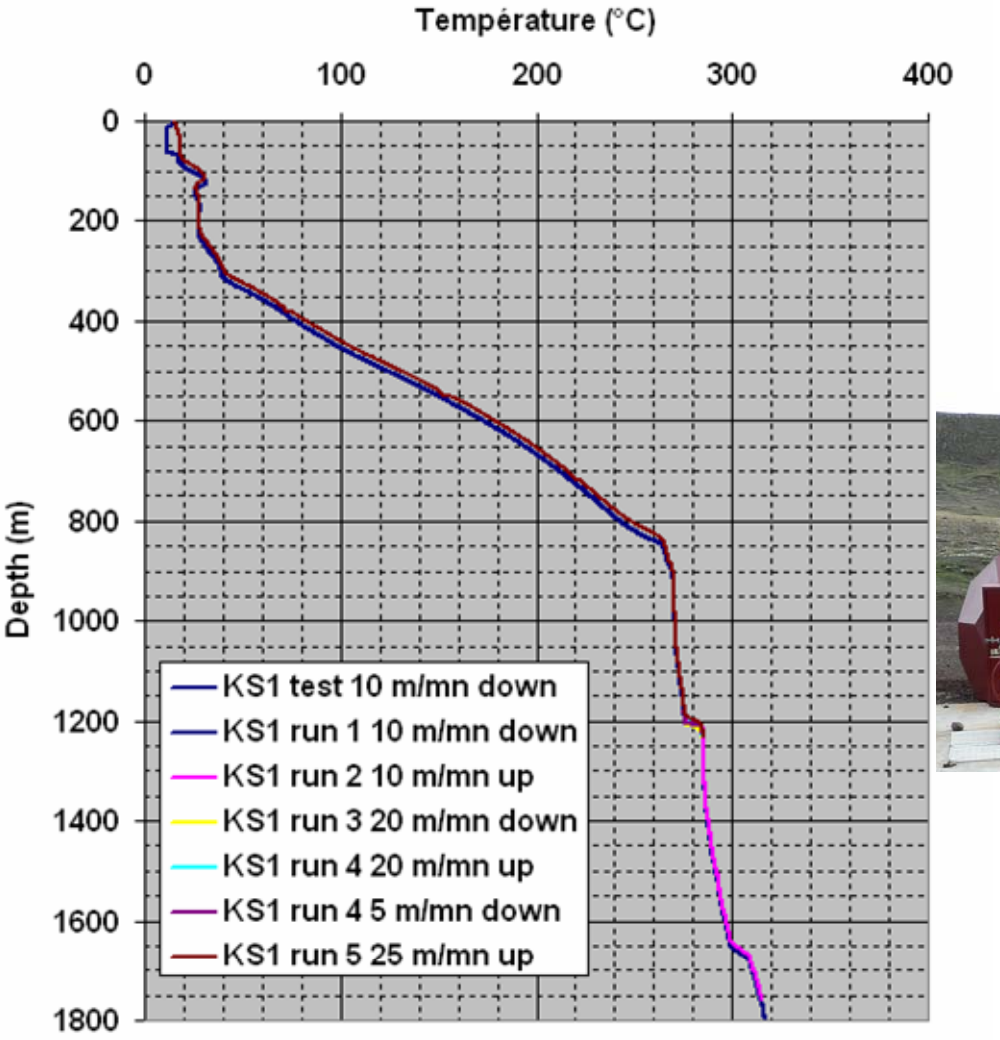
BRGM HiTI Probe – First well logging in Krafla, Borehole KS1: June 2010



Ragnar Ásmundsson
Sveinbjörn Sveinbjörnsson

ISOR High temperature well logging truck

ÍSOR

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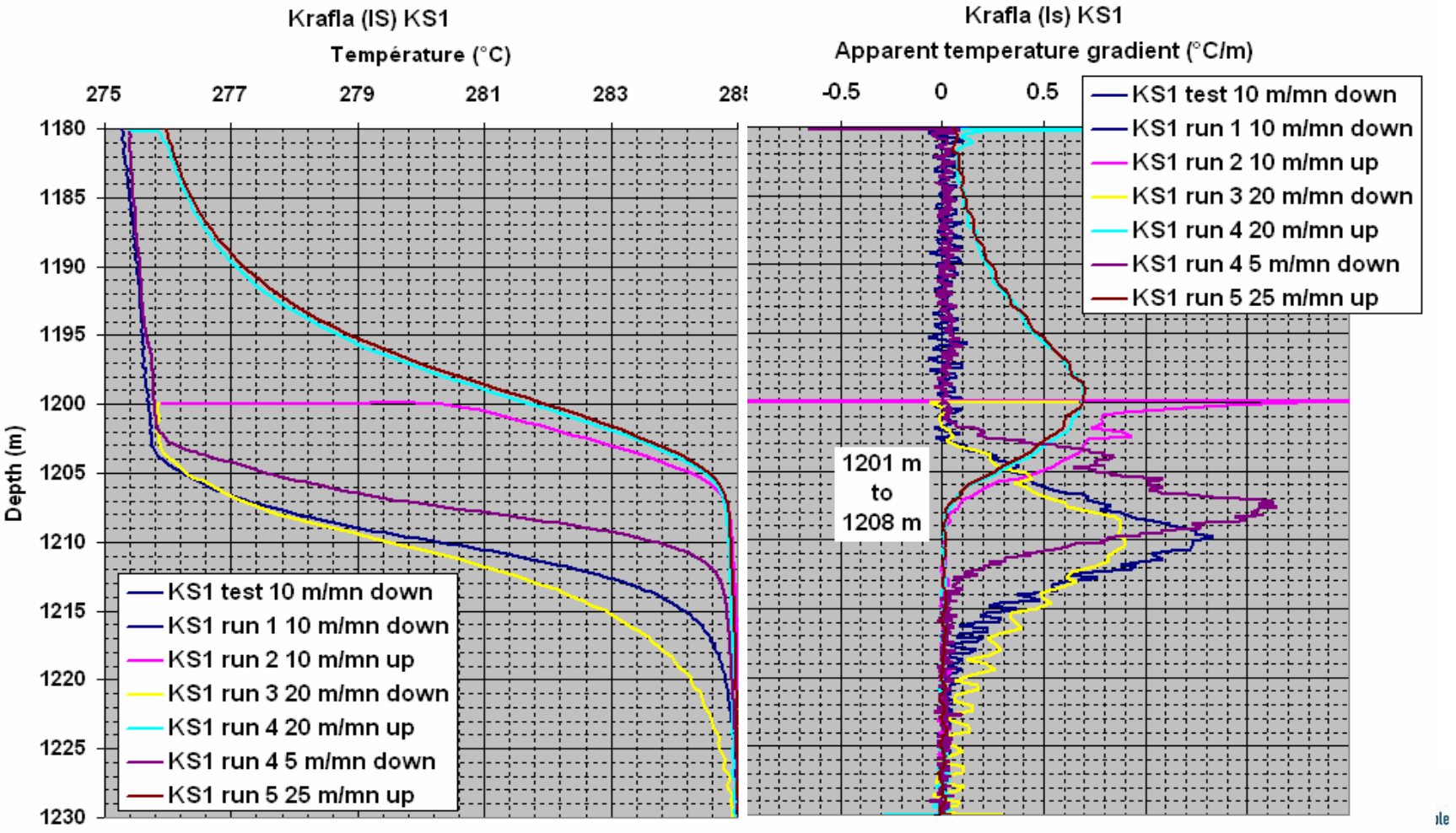
BRGM HiTI Probe – First well logging in Krafla, Borehole KS1: June 2010



First success

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BRGM HiTI Probe – First well logging in Krafla in Borehole KS1: June 2010

Depth calibration

Nominal:	**120 pulses/feet**	**393.70079**	**pulses/feet**
used:		**392.21259**	**pulses/feet**
Computed:			
Run 1 (downward, 1800 m, 10 to 15 m/mn)		**393.66740**	**pulses/feet**
Run 2 (upward, 559 m, 20 m/mn		**381.34220**	**pulses/feet**
Run 5 (upward, 1228 m, 25 m/mn)		**391.08530**	**pulses/feet**

And first fields problems

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The head project looks very interested

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