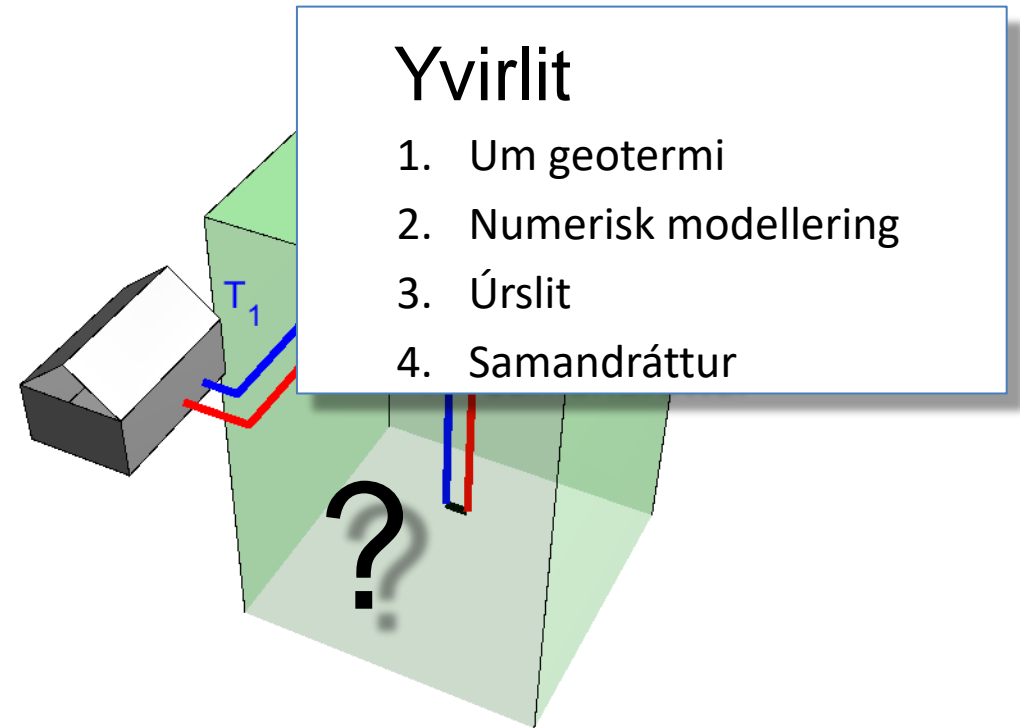


Jarðhitamodelling í Føroyum

Hvussu broytist hitin í undirgrundini í sambandi við nýtslu av jarðhita?

Uni Kárasen Petersen, Jarðfeingi.
Ph.D í jarðalisfrøði, Cand.scient, B.Sc, Maskinmeistari

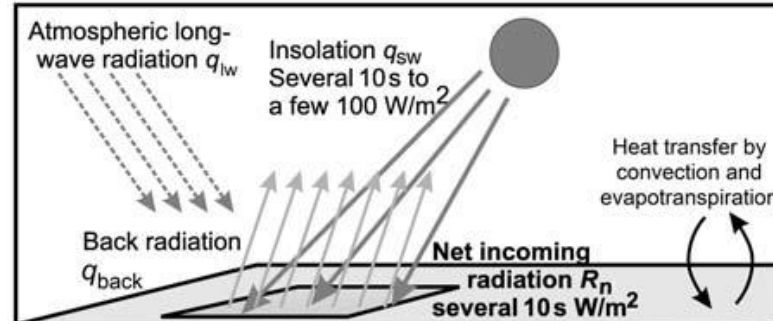
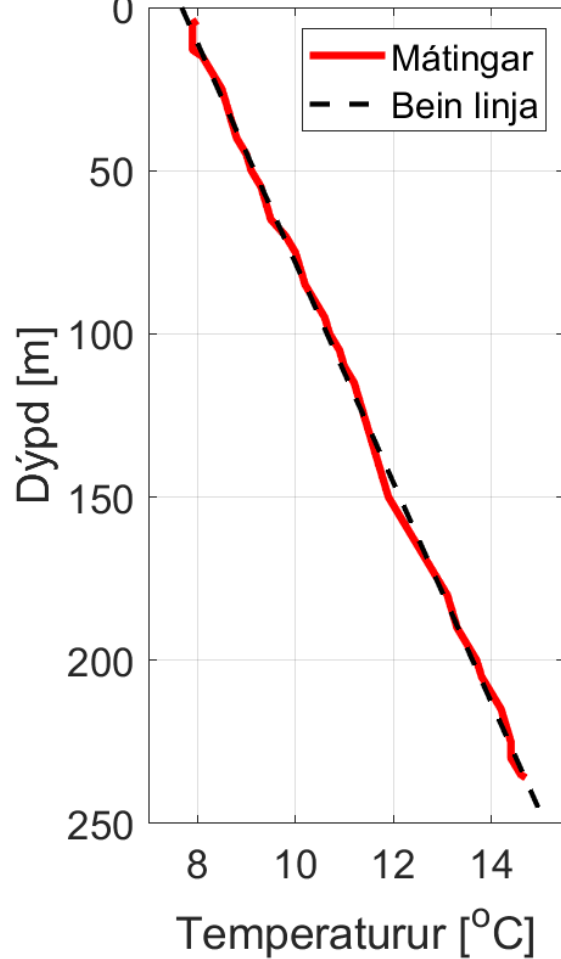
23. september 2022



1. Um geotermi

Geotermiskur gradientur

3°C/100m

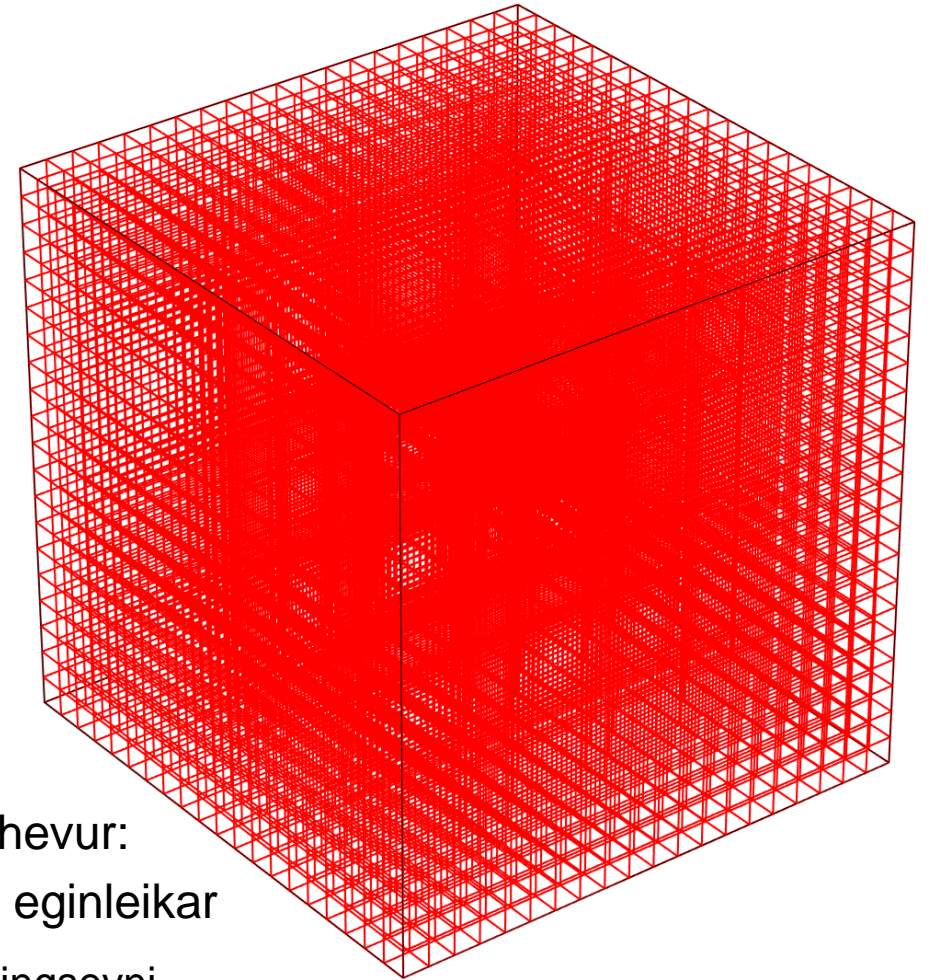


Banks, D. (2008). *An Introduction to the Thermogeology*. Figure 3.6.

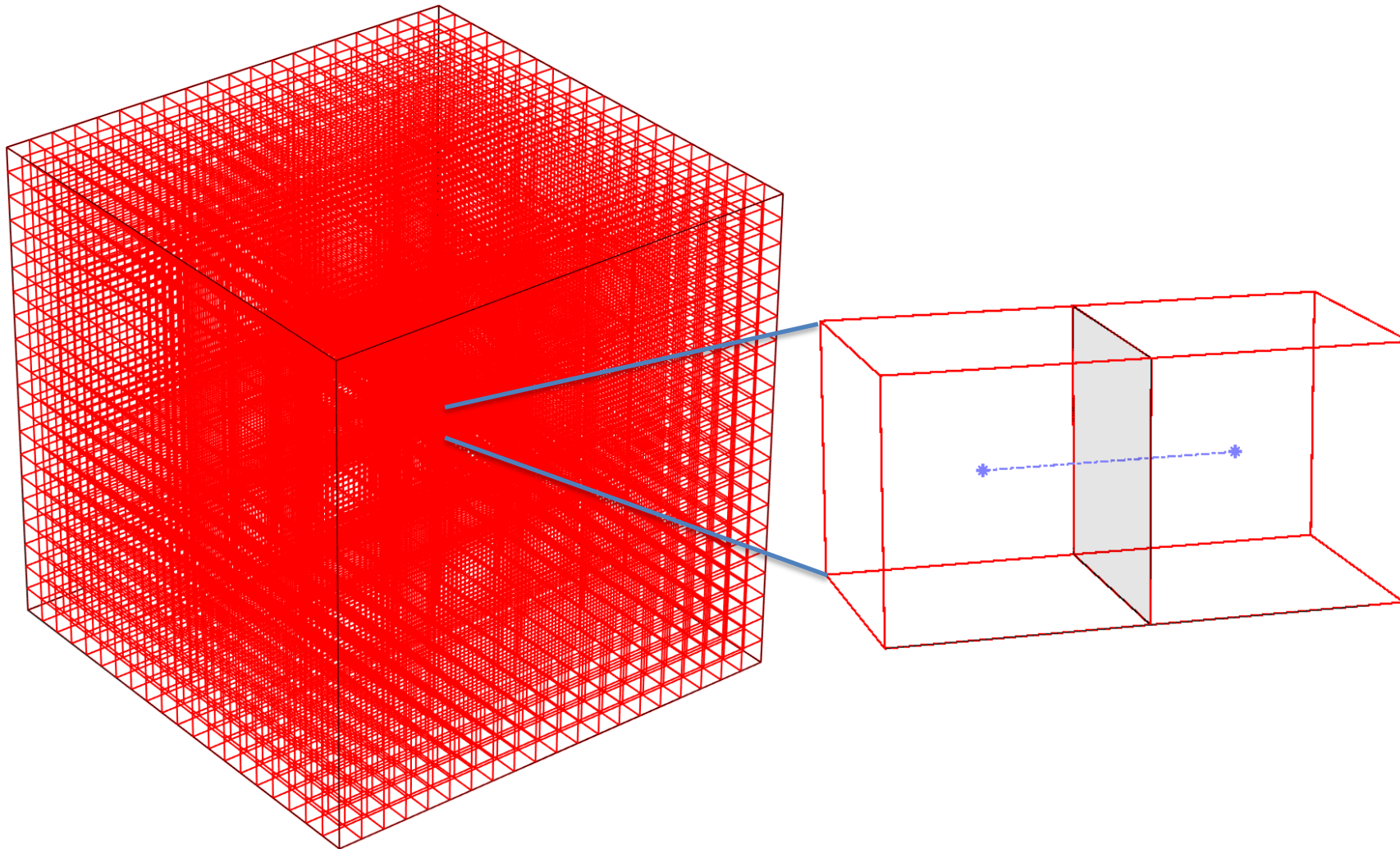


Hvørt gridpunkt hefur:

- Geotermiskar eginleikar
 - Varmaleiðingsevni
 - Varmakapacitet
- Eina stöðu
 - Temperatur



Flutningur av hita millum tvey gridpunkt eitt tíðarbil Δt



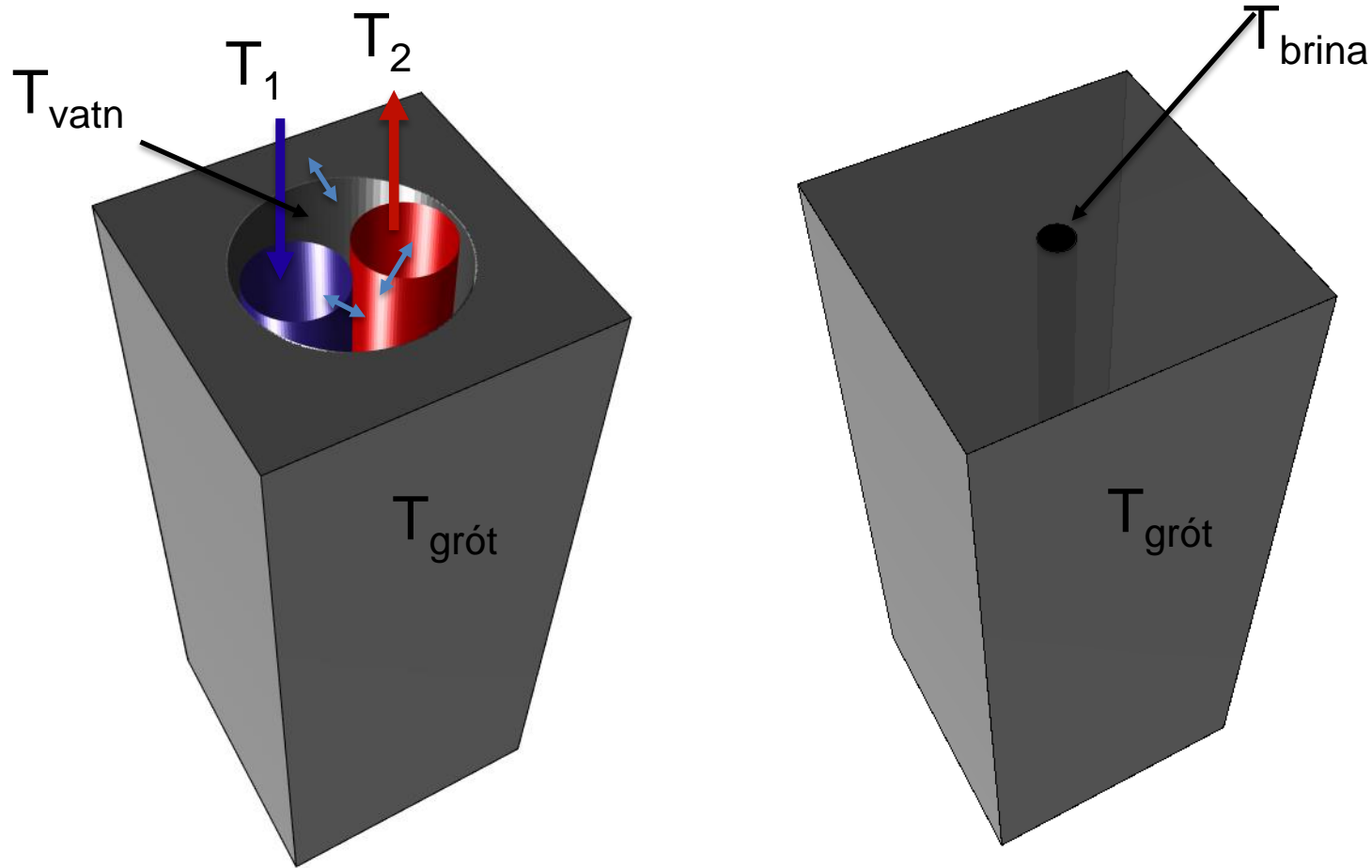
$$q_x = -k \frac{dT}{dx} \left[\frac{W}{m^2} \right]$$

$$Q_x = \dot{Q}_x \cdot \Delta t \text{ [J]}$$

$$Q_{t_2} = Q_{t_1} - Q_x \text{ [J]}$$

$$T_{t_2} = \frac{Q_{t_2}}{C \cdot m} \text{ [K]}$$

Modellering av jarðhitaholi



JARÐFEINGI
FAROESE GEOLOGICAL SURVEY

Modelling of the heat dynamics of a geothermal well at Umhvørvisstovan

This report was made on behalf of
Faroese Environment agency
(Umhvørvisstovan)

umhvørvisstovan

as part of the project
SMARTrenew
(Smarter renewable energy and heating Management for Arctic and northern Rural Territories)

funded by
NPA
(Northern Periphery and Arctic program).

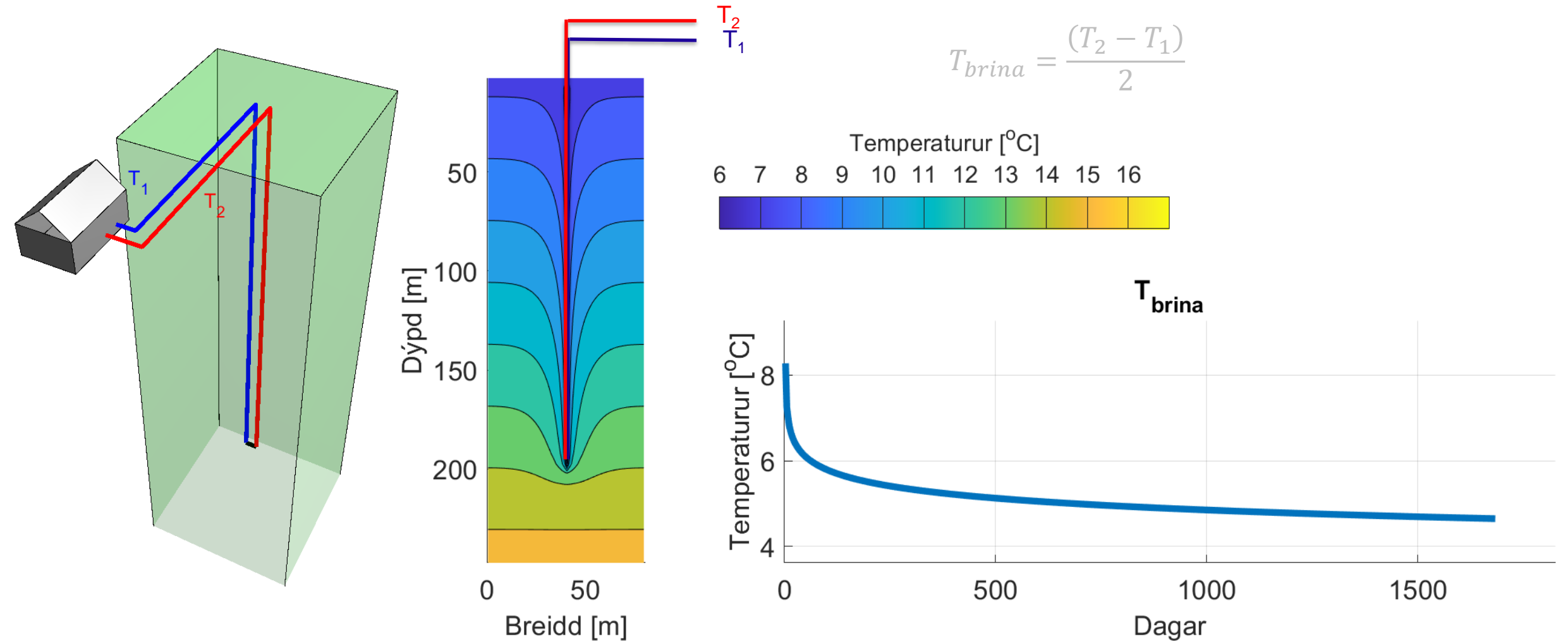
smartrenew
Northern Periphery and Arctic Programme
2014-2020
EUROPEAN UNION
Investing in your future
European Regional Development Fund

JARÐFEINGI · Report JF-J-2022-07



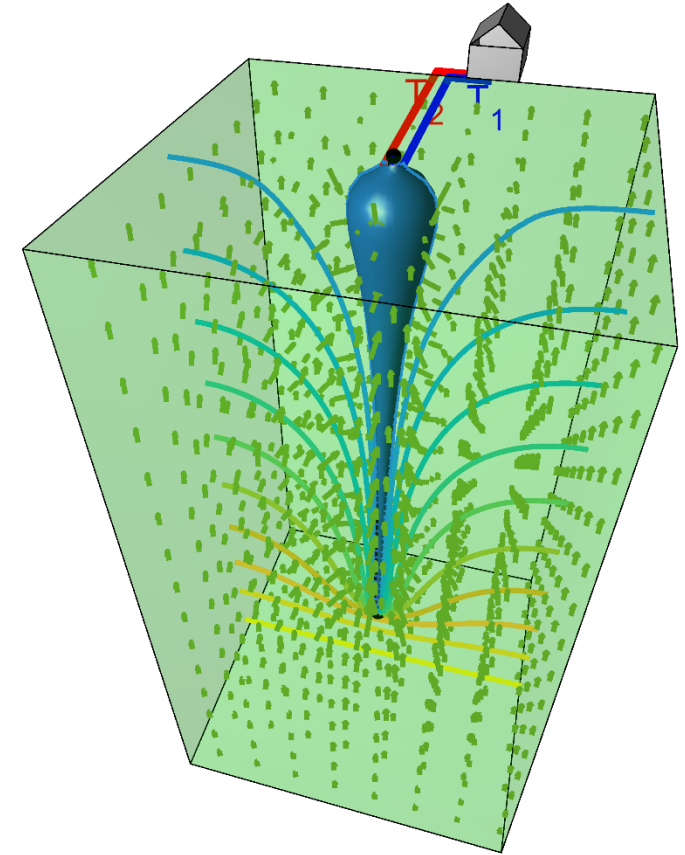
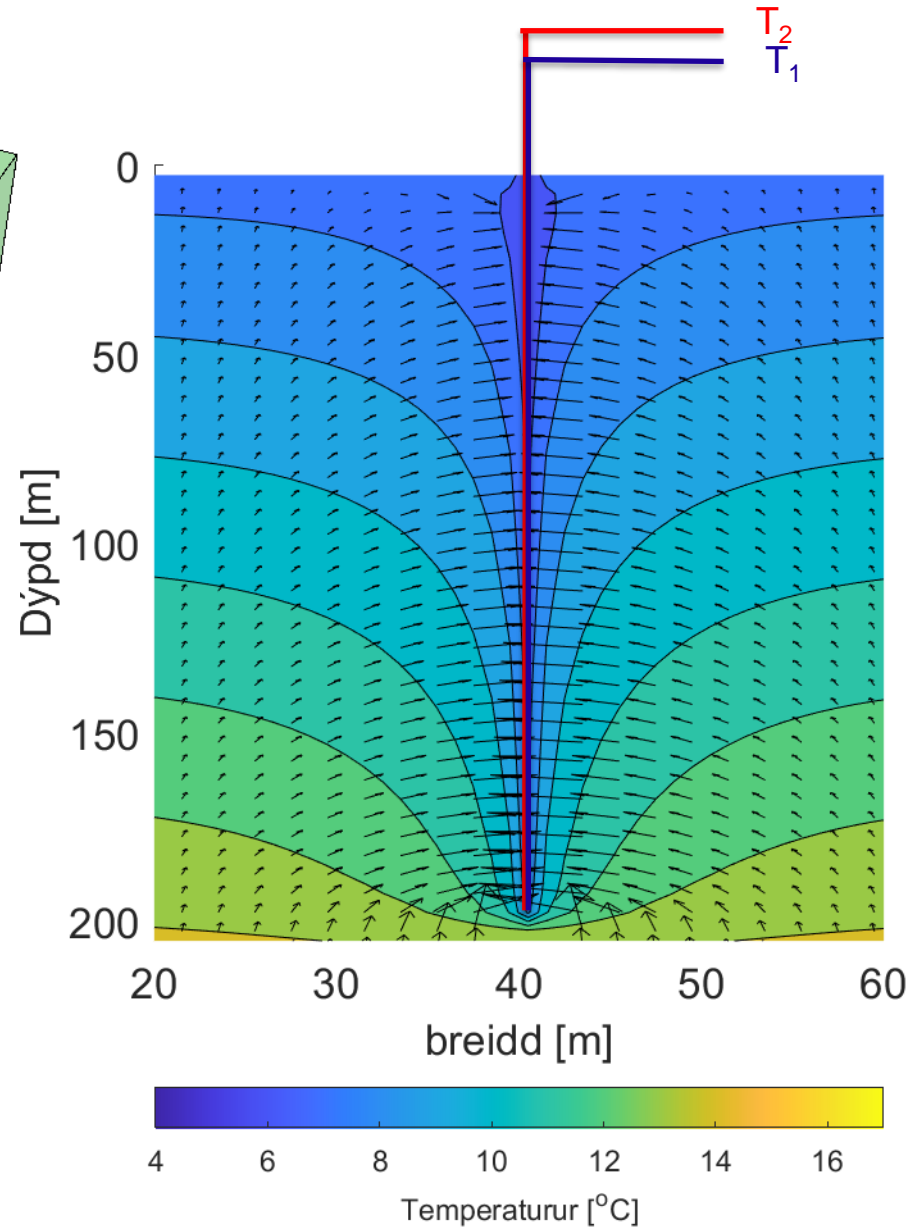
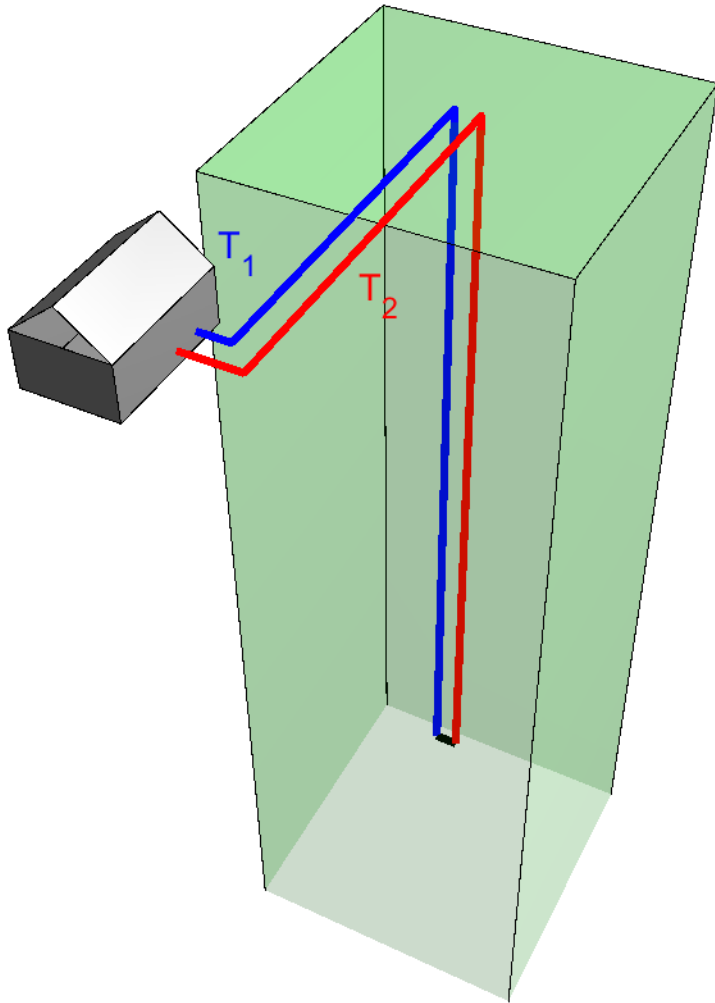
Dømi:

Eini hús brúka 3 kW hitaorku svarandi til umleið 25.000 kWh/ár

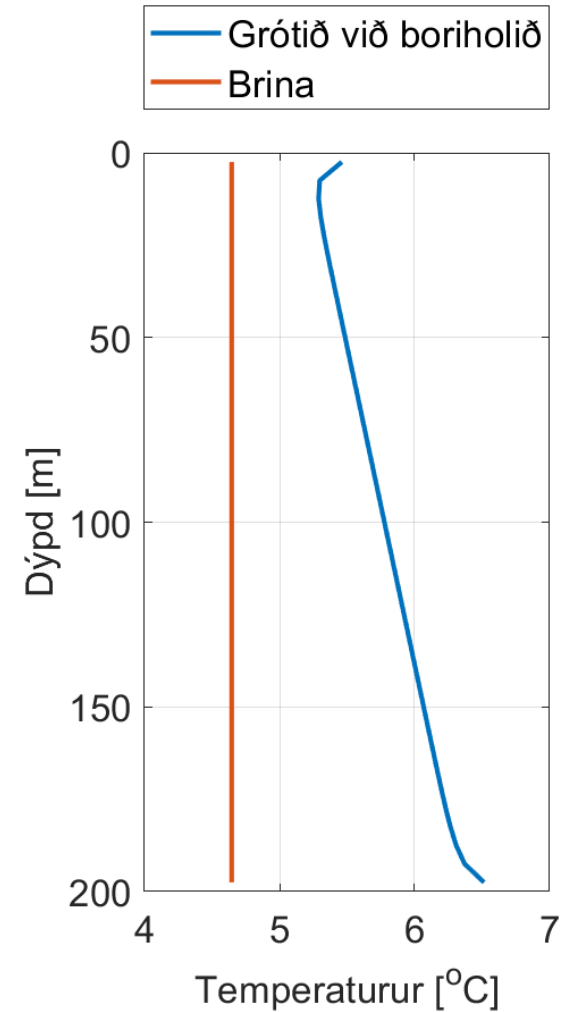
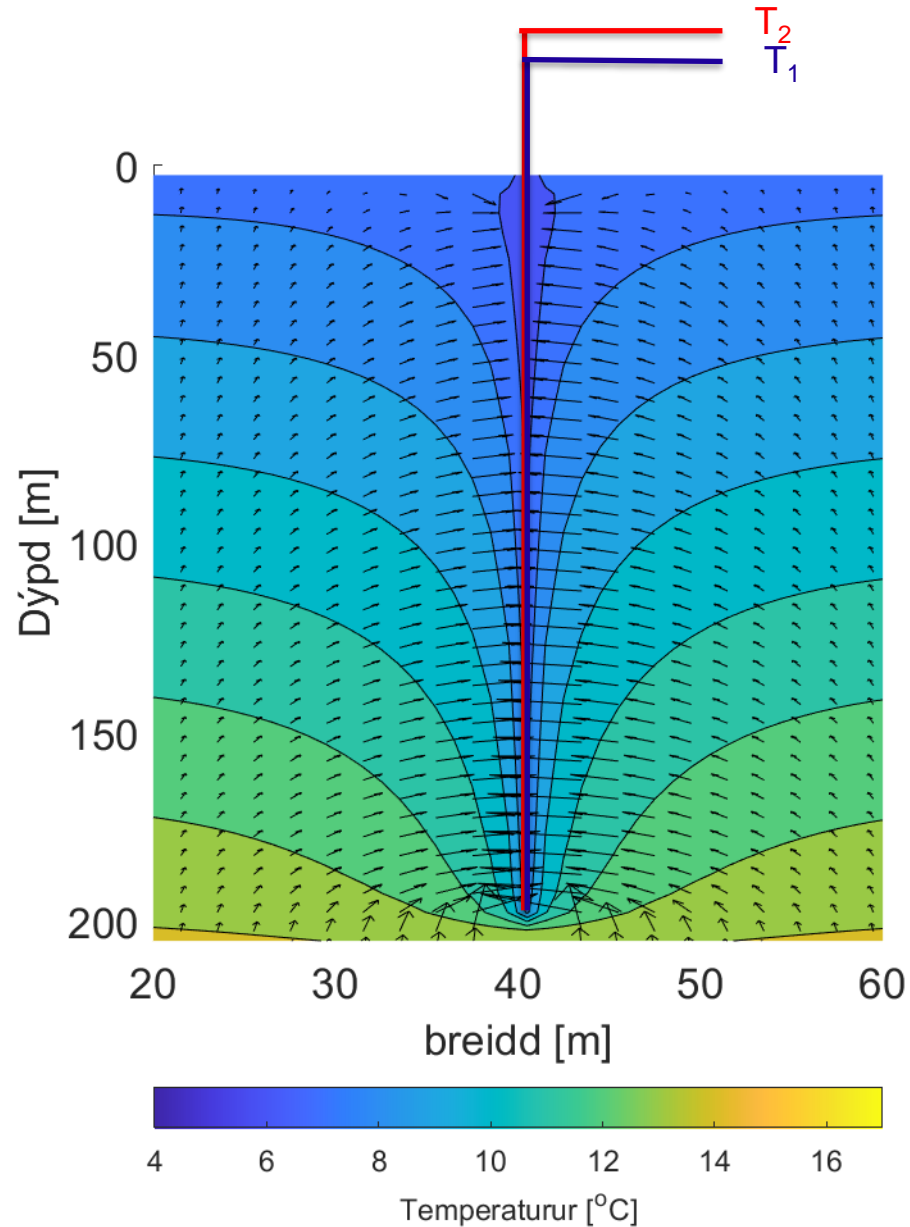


Modellering

Hús við jarðhitaholi



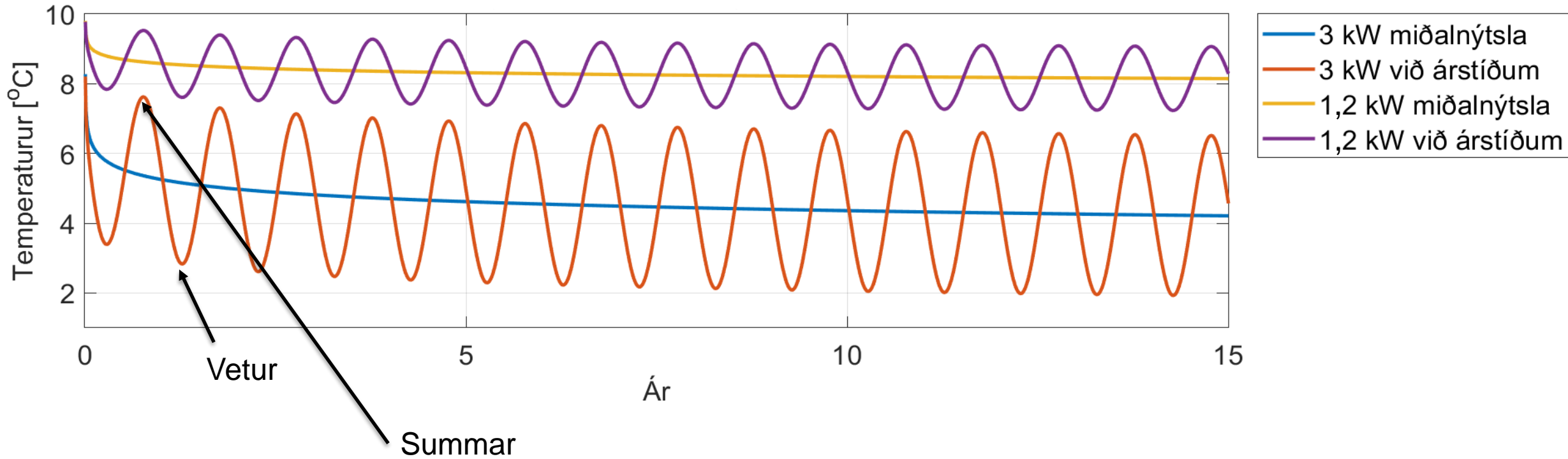
Brinutemperaturur og grótttemperaturur



$$T_{brina} = \frac{(T_2 - T_1)}{2}$$



Temperaturur á brinu yvir 15 ár



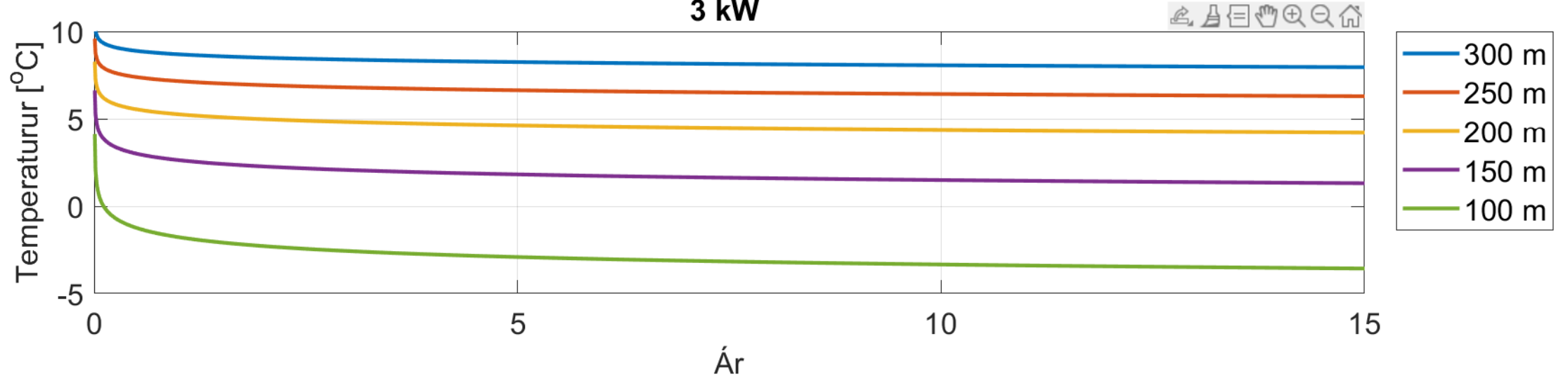
3 kW svarar til 25.000 kWh/ár
1,2 kW svarar til 10.000 kWh/ár



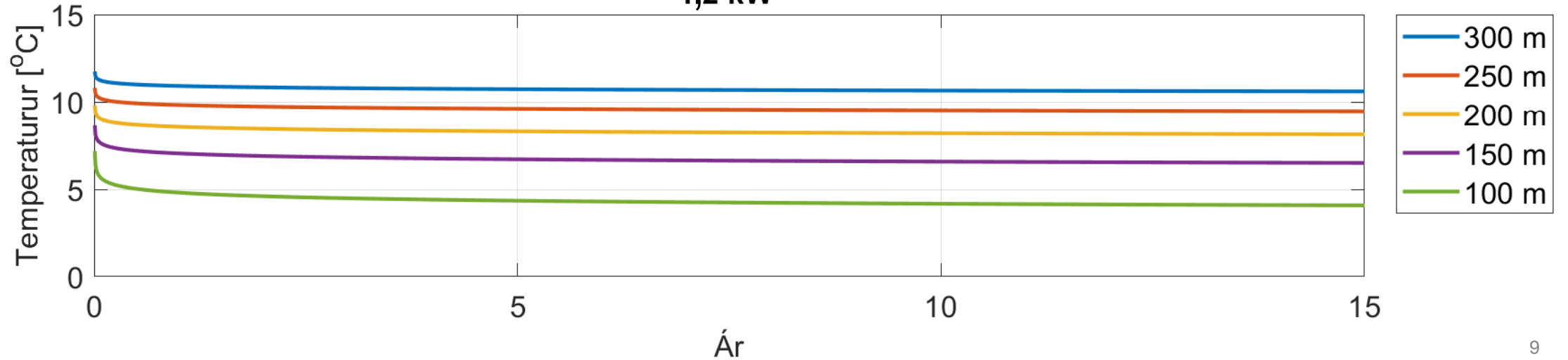
Temperaturur á brinu yvir 15 ár

Jarðhitahol við ymsum longdum

3 kW

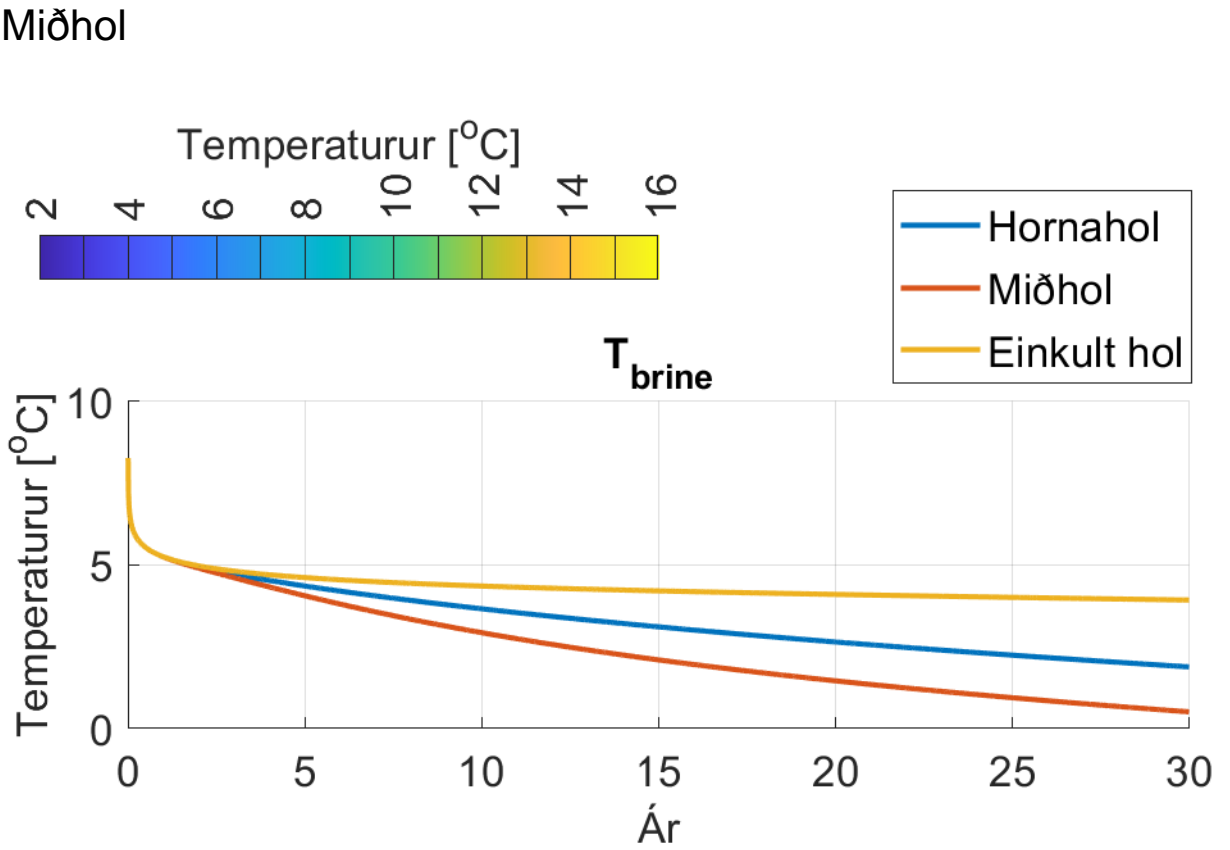
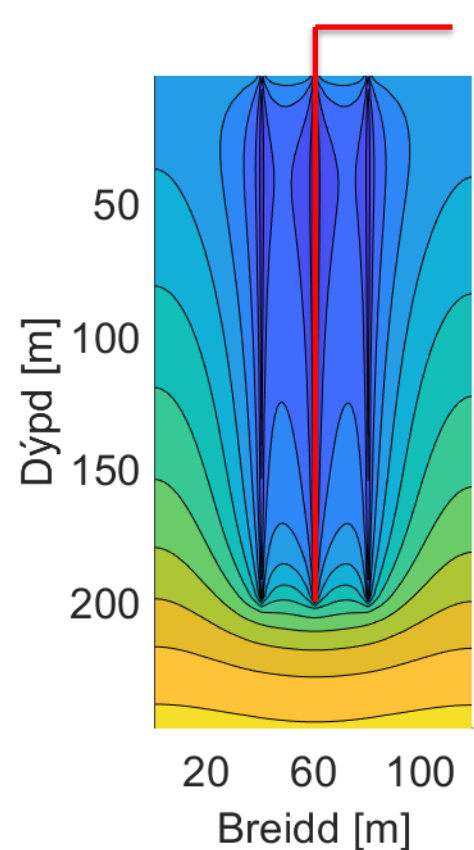
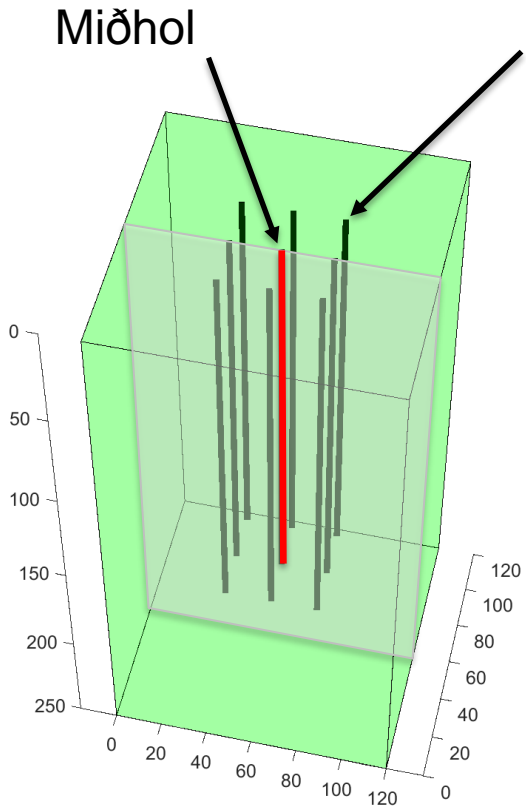


1,2 kW



9 hol, 200 m djúp

- 20 m ímillum hvørt hol
- effekt 3 kW fyri hvørt hol
- í 15 ár



Samandráttur

- Kanningin vísir ítøkiliga, hvussu hitin ferðast í undirgrundini í sambandi við nýtslu av jarðhitaholum.
- Hetta gevur betur grundarlag fyri burðardyggari staðseting av jarðhitaholum í tættbygðum øki.

Ein serlig tøkk til Bjarta Thomsen og Orku á Umhvørvisstovuni í sambandi við royndir í teirra jarðhitaholi.

