In [16]:

```python
import numpy as np

# --- Data ---

data = np.array([
    [33.1, 616.595, 50, 11, 58.8, 16, 55, 08.3, 980938.5930],
    [34,   17.49595, 50, 12, 16.1, 16, 55, 01.5, 980934.9442],
    [35,   21.61250, 50, 12, 30.780577799986304, 16, 55, 14.8, 980931.1021],
    [36,   12.22220, 50, 12, 39.67534620000663, 16, 55, 46.8, 980929.2559],
])

sirka1 = 50.208550278 #   16.919424397
sirka2 = 50.208550043 #  16.919424341

# --- Převody ---
def dms2dec(deg, minute, sec):
    return deg + minute / 60 + sec / 3600

def dec2dms(dec):
    sign = 1 if dec >= 0 else -1
    dec = abs(dec)
    deg = int(dec)
    rem = (dec - deg) * 60
    minute = int(rem)
    sec = (rem - minute) * 60
    return sign * deg, minute, sec

sirka = (sirka1 + sirka2)/2

sirka = dec2dms(sirka)

print(sirka)

rad = np.pi / 180

# --- Rozdělení dat ---
cb = data[:, 0].astype(int)
h = data[:, 1]
B = dms2dec(data[:, 2], data[:, 3], data[:, 4]) * rad
L = dms2dec(data[:, 5], data[:, 6], data[:, 7]) * rad
g = data[:, 8] * 1e-5

# --- Přibližný výpočet ---
H = np.cumsum(h)

# --- Normální ortometrická korekce ---
delta_B = np.diff(B) / rad * 3600
H_s = (H[:-1] + H[1:]) / 2
c_gamma_AB = -0.0000254 * H_s * delta_B * 0.001

# --- Korekce z tíhových anomálií ---
gamma_0 = (978030 * (1 + 0.005302 * np.sin(B)**2 - 0.000007 * np.sin(2 * B)**2)) * 1e-5
print(gamma_0)
Delta_g_F = g + 0.3086 * 1e-5 * H - gamma_0
H_niv = h[1:]
Delta_g_F_AB = (Delta_g_F[:-1] + Delta_g_F[1:]) / 2
c_Delta_g_AB = 0.0010193 * 1e5 * Delta_g_F_AB * H_niv * 0.001

# --- Normální Mololoděnského výška ---
h_Q = H_niv + c_gamma_AB + c_Delta_g_AB
H_Q = H.copy()
H_Q[1:] = H[1:] + np.cumsum(c_gamma_AB + c_Delta_g_AB)

Delta_g_B = Delta_g_F - np.concatenate([[0], c_Delta_g_AB])
print(Delta_g_B)

# --- Výstup ---
h[0] = 0
h_Q = np.insert(h_Q, 0, 0)
c_gamma_AB = np.insert(c_gamma_AB, 0, 0)
c_Delta_g_AB = np.insert(c_Delta_g_AB, 0, 0)

print(f"{'Bod':>2} {'H [m]':>20} {'H_Q [m]':>20} {'h [m]':>20} {'h_Q [m]':>20} {'c_gamma_AB [mm]':>20} {'c_Delta_g_AB [mm]':>20}")
print("-" * 130)
for i in range(len(H)):
    print(f"{cb[i]:2d} {H[i]:20.6f} {H_Q[i]:20.6f} {h[i]:20.6f} {h_Q[i]:20.6f} {c_gamma_AB[i]*1000:20.6f} {c_Delta_g_AB[i]*1000:20.6
```

```
(50, 12, 30.780577799986304)
[9.81084147 9.81084575 9.81084939 9.81085159]
[ 0.00044727 -0.00034894 -0.00055646 -0.00011282]
Bod                H [m]              H_Q [m]                h [m]              h_Q [m]      c_gamma_AB [mm]    c_Delta_g_AB [mm]
----------------------------------------------------------------------------------------------------------------------------------
33           616.595000           616.595000             0.000000             0.000000             0.000000             0.000000
34           634.090950           634.091485            17.495950            17.496485            -0.274788             0.809437
35           655.703450           655.704786            21.612500            21.613301            -0.240474             1.041593
36           667.925650           667.927451            12.222200            12.222665            -0.149522             0.615010
```