

Supplementary Materials.

Supplementary Table S1. Characteristics of the participants.

Age, y	Height, cm	Weight, kg	BMI, kg/m ²	Procedure	HR _{rest} , beats/min	Weather	Temperature, °C	Relative humidity, %
47	185.3	86.3	25.1	Morning	67	Cloudy/sunny	14.9	59.8
30	161.6	53.7	20.6	Morning	67	Cloudy	14.9	86.7
63	166.9	75.6	27.1	Morning	50	Sunny	16.1	46.6
37	171	70.9	24.2	Afternoon	64	Cloudy	17.1	65.7
53	164.4	64.8	24.0	Afternoon	73	Sunny	17.7	50.4
53	176.2	62.8	20.2	Afternoon	66	Cloudy	21.2	99.2

BMI: body mass index was calculated as weight/height²; HR_{rest}: resting heart rate. Outdoor temperature and relative humidity were recorded at Forestry and Forest Products Research Institute, and the values were at the start of the measurement.

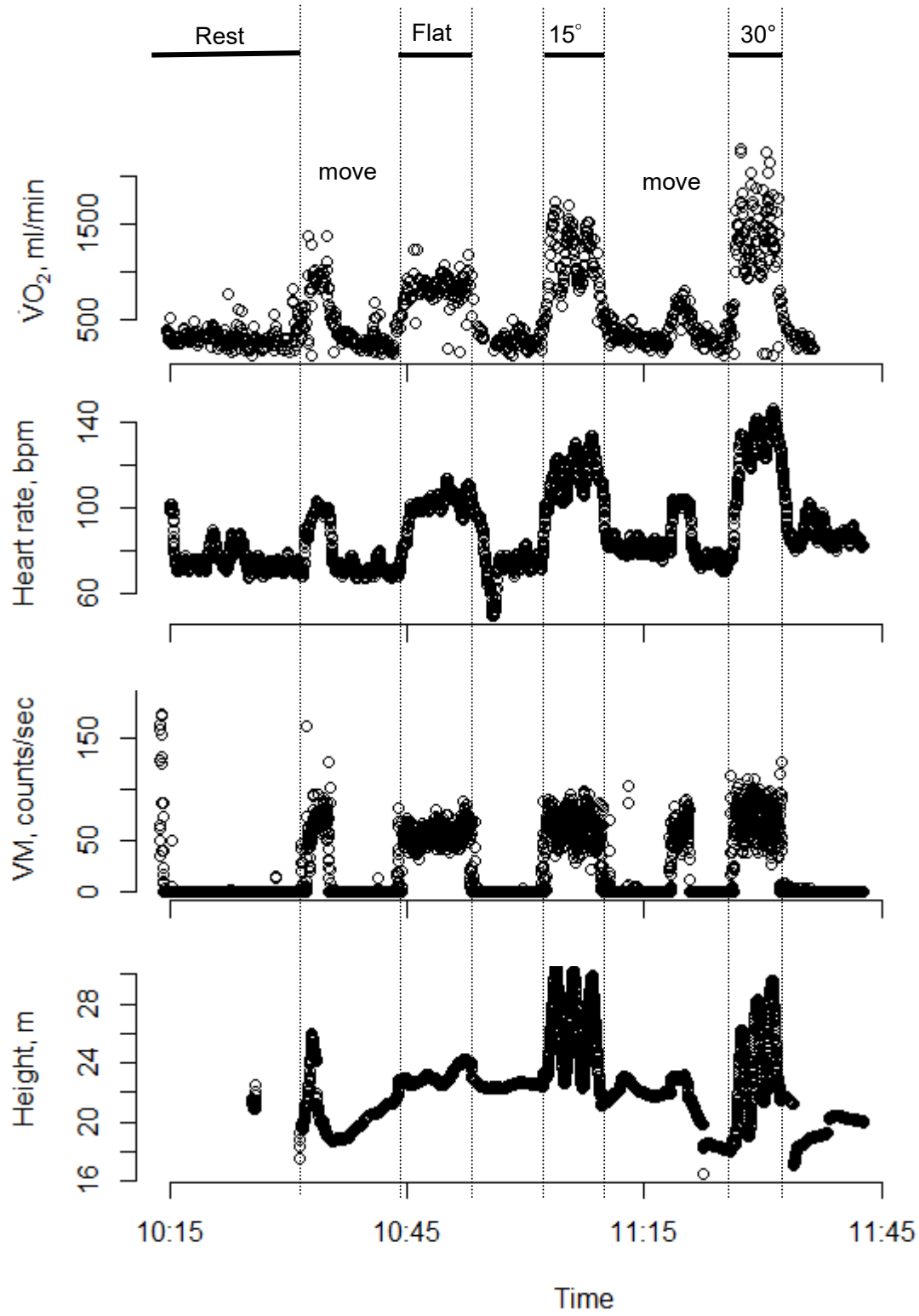
Supplementary Figure S1. Participants during the measurement.



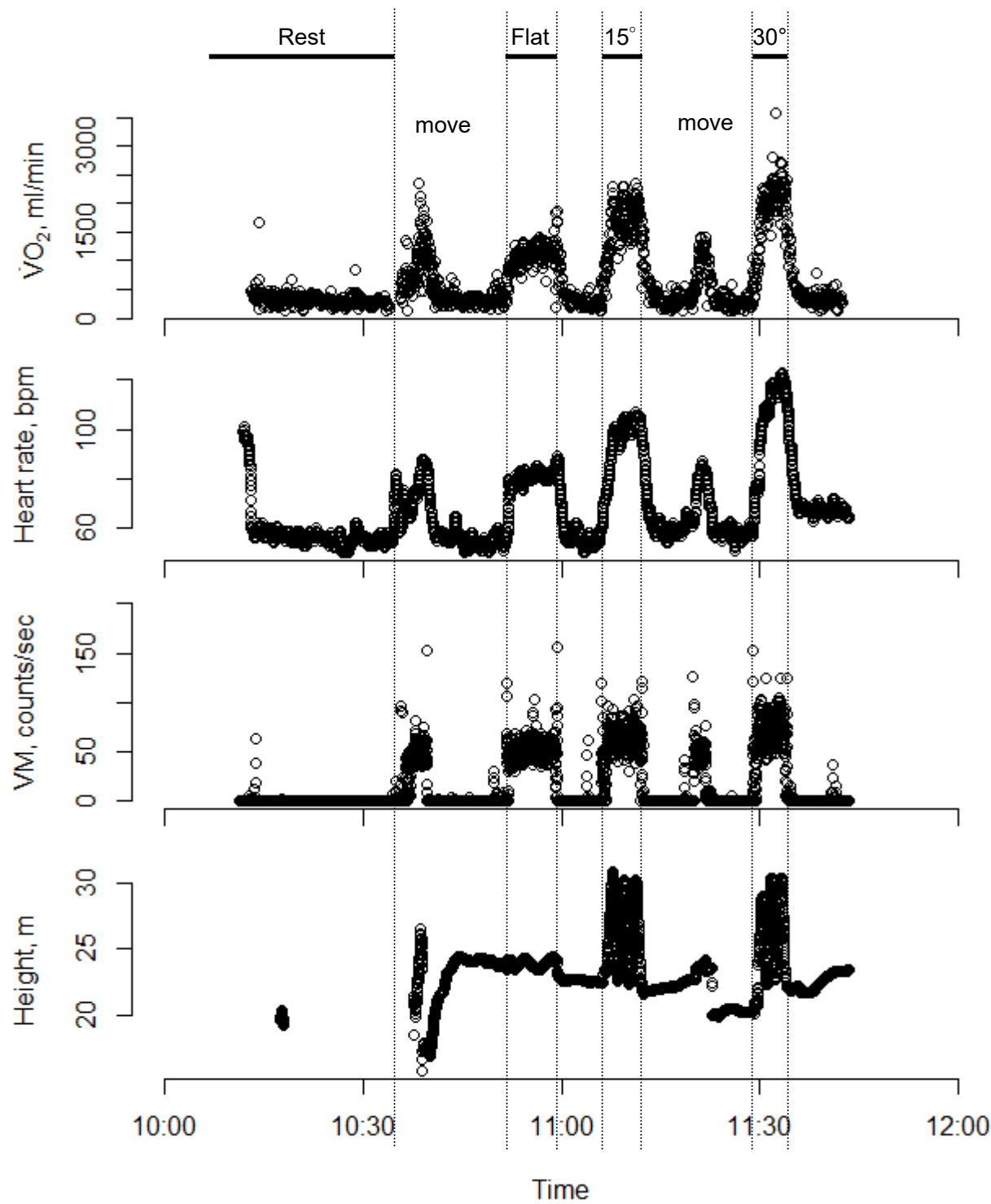
Supplementary Figure S1. Participants during the measurement. a) and b) walking uphill on 15°- and 30°-slope, respectively. The participants shouldered a frame pack, and wore a helmet, gloves, and boots. c) resting between walking. During rest, a frame pack was unloaded but measurement devices were kept worn. A mask and a box on the front chest were a portable indirect calorimeter.

Supplementary Figure S2. Time-course of measurement variables of other participants. Participants 2–6, excepting for one depicted in Figure 1. All legends are the same, but Participant 6’s data from the global navigation satellite system (GNSS) was missed. In each panel, from top to bottom, oxygen consumption ($\dot{V}O_2$; ml/min) in breath by breath, heart rate (beats/min, bpm) in second, vector magnitude (VM; counts/sec) of the accelerometer in one second epoch, and height from the GNSS device in meter for one participant. The participant walked on flat, 15°- and 30°-slope grounds after resting on chair. Before walking on flat ground and 30°-slope, the participant moved to each starting point.

Participant 2.



Participant 3



Participant 4

