第1次作业

危国锐 516021910080

（上海交通大学电子信息与电气工程学院，上海 200240）

摘要：摘要.

关键词：关键词1，关键词2

Homework 1

Guorui Wei 516021910080

(*School of Electronic Information and Electrical Engineering*,  
*Shanghai Jiao Tong University*, *Shanghai* 200240, *China*)

**Abstract****:** Abstract.

**Keywords:** keyword 1, keyword 2

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# Question 1

“If you are standing atop Mount Everest at 8848 m, about what fraction of mass of the atmosphere is below you? (Use eq. [(1.6)](https://www.sciencedirect.com/science/article/pii/B9780123285317000013#e0035).)”([Hartmann, 2016, p. 23](#_ENREF_1))

## Solution

About

of mass of the atmosphere is below me, according to eq. [(1.6)](https://www.sciencedirect.com/science/article/pii/B9780123285317000013#e0035) ([Hartmann, 2016, p. 10](#_ENREF_1)).

# Question 2

“Compute the difference of saturation [vapor pressure](https://www.sciencedirect.com/topics/earth-and-planetary-sciences/vapour-pressure) between 0°C and 30°C. Compare the results you get with eqs [(1.10)](https://www.sciencedirect.com/science/article/pii/B9780123285317000013#e0055) and [(1.11)](https://www.sciencedirect.com/science/article/pii/B9780123285317000013#e0060).”([Hartmann, 2016, p. 23](#_ENREF_1))

## Solution

Using eq. [(1.10)](https://www.sciencedirect.com/science/article/pii/B9780123285317000013#e0055) ([Hartmann, 2016, p. 12](#_ENREF_1)), the difference of saturation [vapor pressure](https://www.sciencedirect.com/topics/earth-and-planetary-sciences/vapour-pressure) between 0°C and 30°C is

while this value becomes

using eq. [(1.11)](https://www.sciencedirect.com/science/article/pii/B9780123285317000013#e0060) ([Hartmann, 2016, p. 13](#_ENREF_1)).

As can be seen from the calculations above, eq. [(1.10)](https://www.sciencedirect.com/science/article/pii/B9780123285317000013#e0055) underestimates the difference, because the second derivative of saturated vapor pressure with temperature is positive ([Hartmann, 2016, p. 13, Fig.1.9](#_ENREF_1)).

References

Hartmann, D. L. (2016). Chapter 1 - Introduction to the Climate System. In D. L. Hartmann (Ed.), *Global Physical Climatology (Second Edition)* (pp. 1-23). Elsevier. <https://doi.org/10.1016/B978-0-12-328531-7.00001-3>