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# Venus Conditions for the IPPW-6 Short Course Exercise

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Ref: A. Sieff et al., "Models of the Structure of the Atmosphere of Venus from the Surface to 100 Kilometers Altitude", Advances in Space Research vol 5 no. 11, pp 3-58, 1985. (Venus International Reference Atmosphere, Chapter I). (pressure/density/temperature vs. altitude)

Ref: V. Kerzhanovich et al., "Circulation of the atmosphere from the surface to 100 km", Advances in Space Research vol 5 no. 11, pp 59-83, 1985. (Venus International Reference Atmosphere, Chapter II). (zonal and meridional winds vs. altitude)

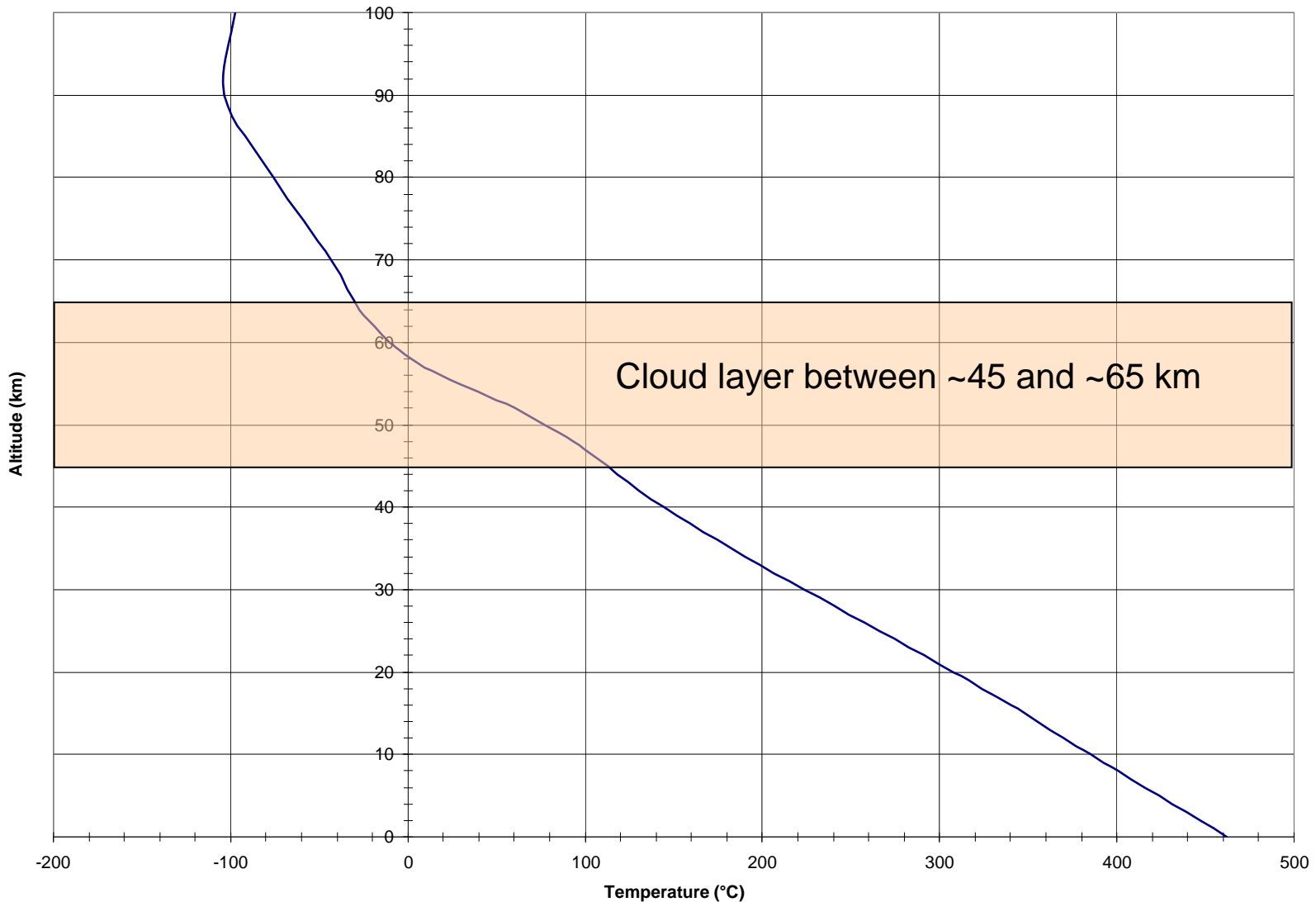
# Venus Conditions

- **Greenhouse** effect results in VERY HIGH SURFACE TEMPERATURES
- Average surface **temperature**: ~ 460°C to 480°C
- Average **pressure** on the surface: ~ 92 bars
- Cloud layer composed of **aqueous sulfuric acid droplets**
  - at ~45 to ~65 km altitude
- Venus atmosphere is **mainly CO<sub>2</sub> (96.5%)** and N<sub>2</sub> (3.5%) with:
  - small amounts of noble gases (He, Ne, Ar, Kr, Xe)
  - small amount of reactive trace gases (SO<sub>2</sub>, H<sub>2</sub>O, CO, OCS, H<sub>2</sub>S, HCl, SO, HF ...)
- **Zonal winds**: at 4 km altitude ~ 1 m/s;  
at 55 km altitude ~60 m/s;  
at 65 km altitude ~95 m/s
- **Superrotating** prograde jets in the upper atmosphere

# Venus Conditions

Altitude z(km)	Temperature T (°C)	Pressure p(bars)	Density rho(kg/m <sup>3</sup> )	Zonal Umean (m/s)	Meridional V (m/s)
0	462.15	92.1	64.79	0.6	0
1	454.55	86.45	61.56	0.7	0.1
2	447.05	81.09	58.45	0.8	0.2
3	439.25	76.01	55.47	0.9	0.3
4	431.45	71.2	52.62	1	0.4
5	423.65	66.65	49.87	1.2	0.5
6	415.65	62.35	47.24	1.3	0.6
7	407.95	58.28	44.71	1.9	0.7
8	400.45	54.44	42.26	2.4	0.8
9	392.65	50.81	39.95	3.4	0.9
10	385.05	47.39	37.72	4.5	1
15	347.65	33.04	27.95	16.1	1.5
20	307.55	22.52	20.39	27.6	2
25	266.05	14.93	14.57	32.3	2.5
30	223.75	9.581	10.15	35.5	3
35	182.35	5.917	6.831	37.3	3.5
40	144.45	3.501	4.404	40.7	4
45	112.25	1.979	2.693	54.2	4.5
50	77.35	1.066	1.594	60.9	6
55	29.15	0.5314	0.9207	59.9	7.5
60	-10.35	0.2357	0.4694	77.2	9
70	-43.35	0.0369	0.08393	92	14
80	-76.05	0.004476	0.01186	57	14
90	-103.75	0.0003736	0.001151	16	20
100	-97.75	0.0000266	0.0000789	10	40

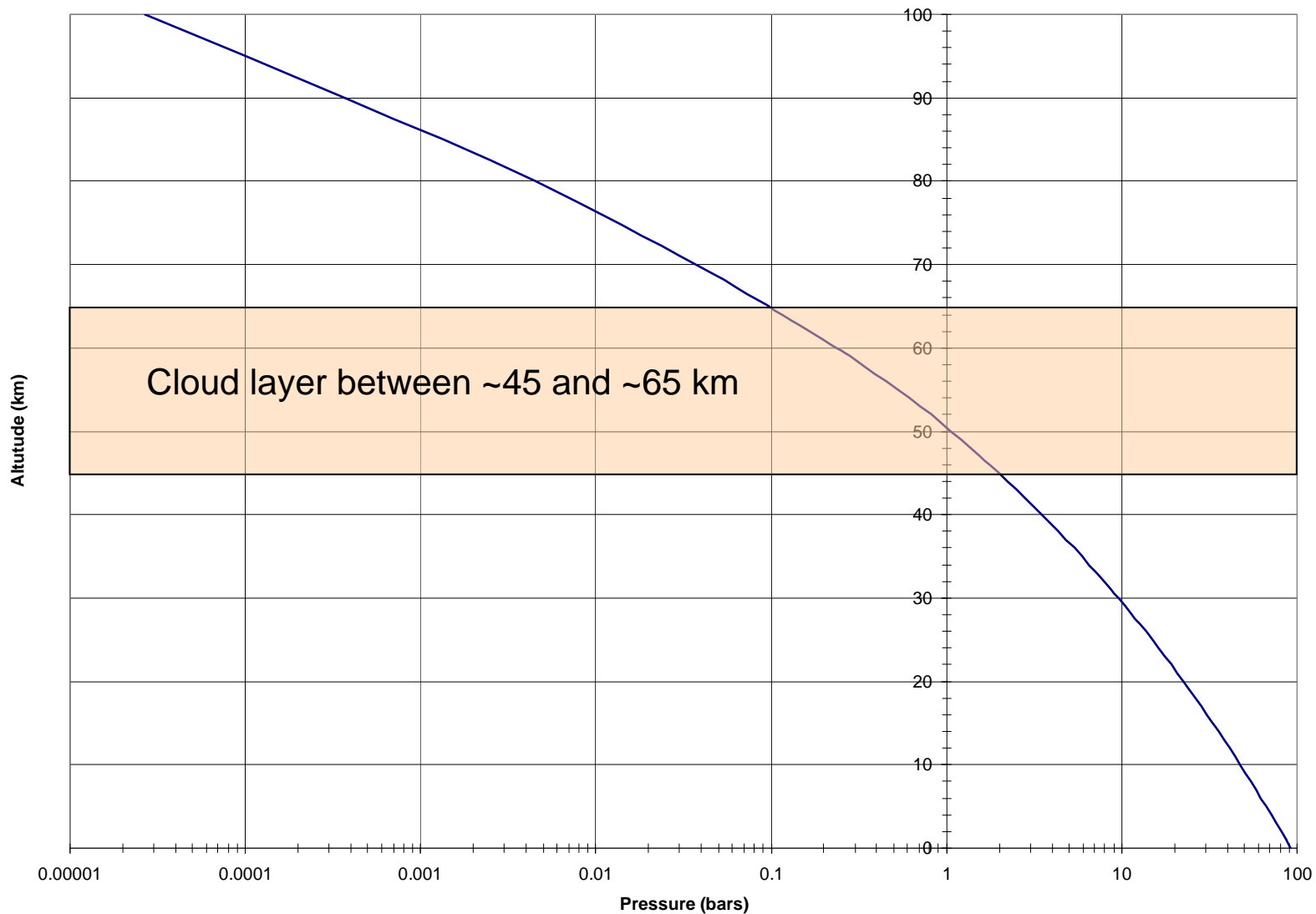
# Venus Temperatures



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Preliminary - For Discussion Purposes Only

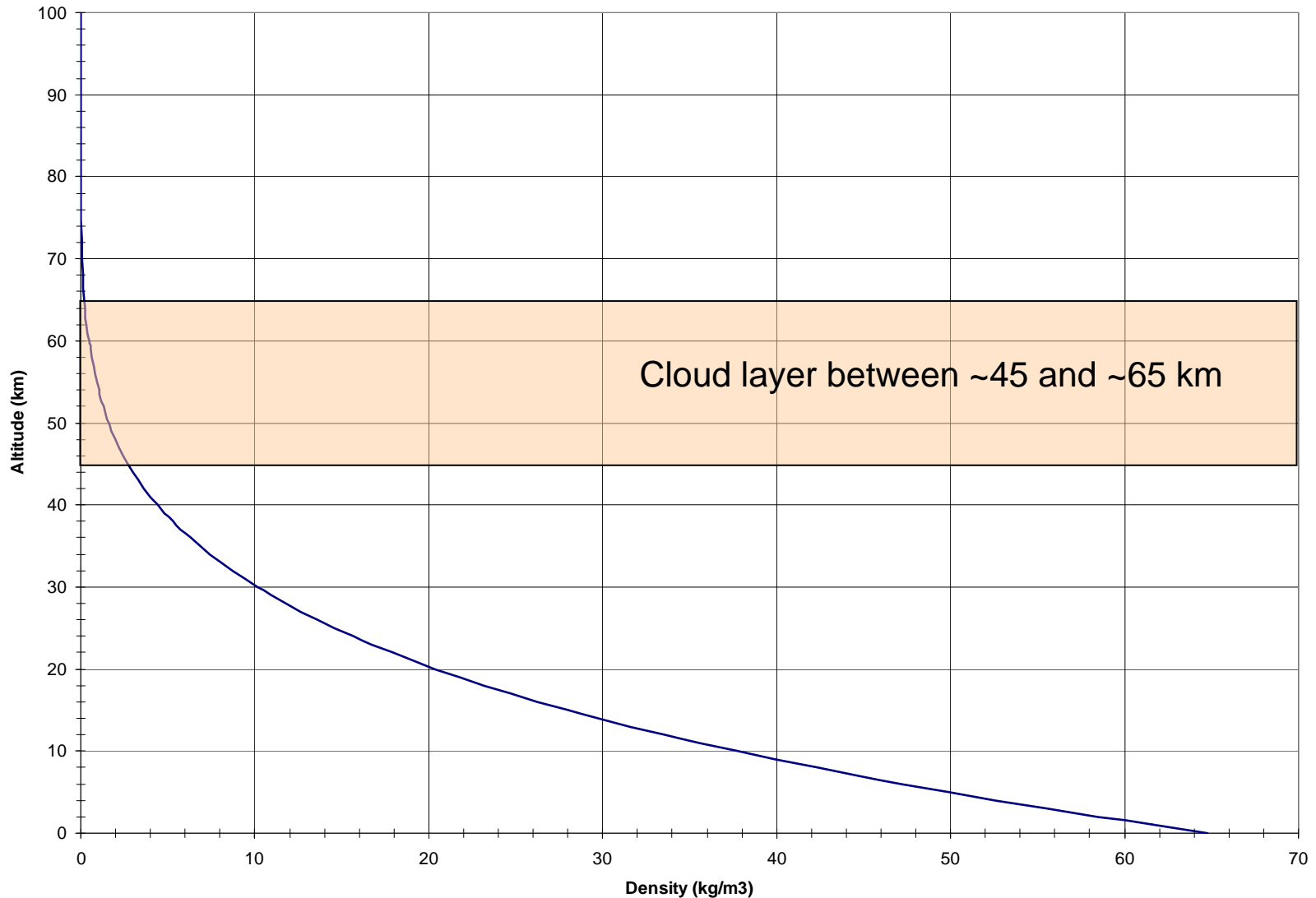
# Venus Pressures



Ref: A. Siefert et al., "Models of the Structure of the Atmosphere of Venus from the Surface to 100 Kilometers Altitude", Advances in Space Research vol 5 no. 11, pp 3-58, 1985. (Venus International Reference Atmosphere, Chapter I).

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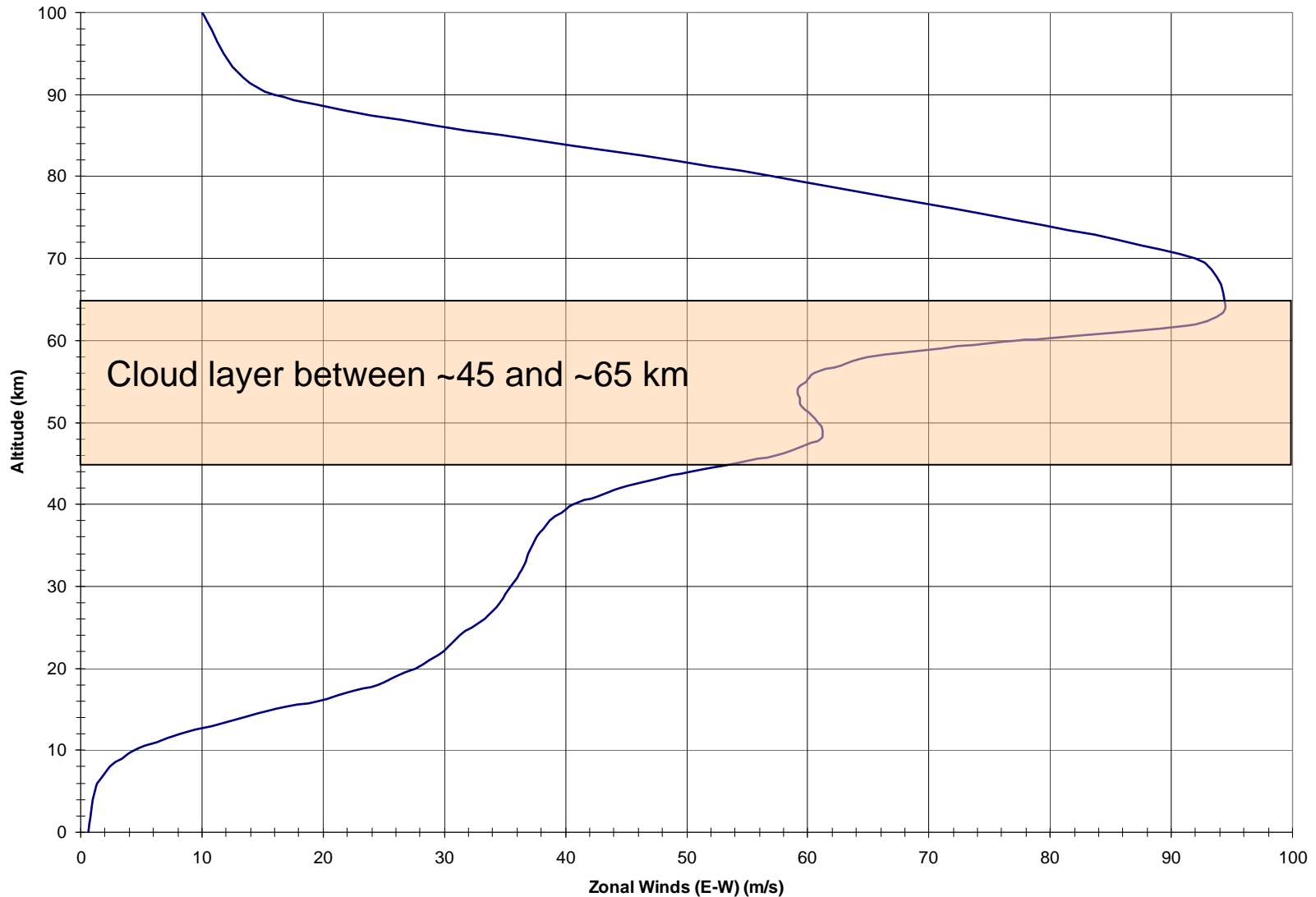
# Venus Densities



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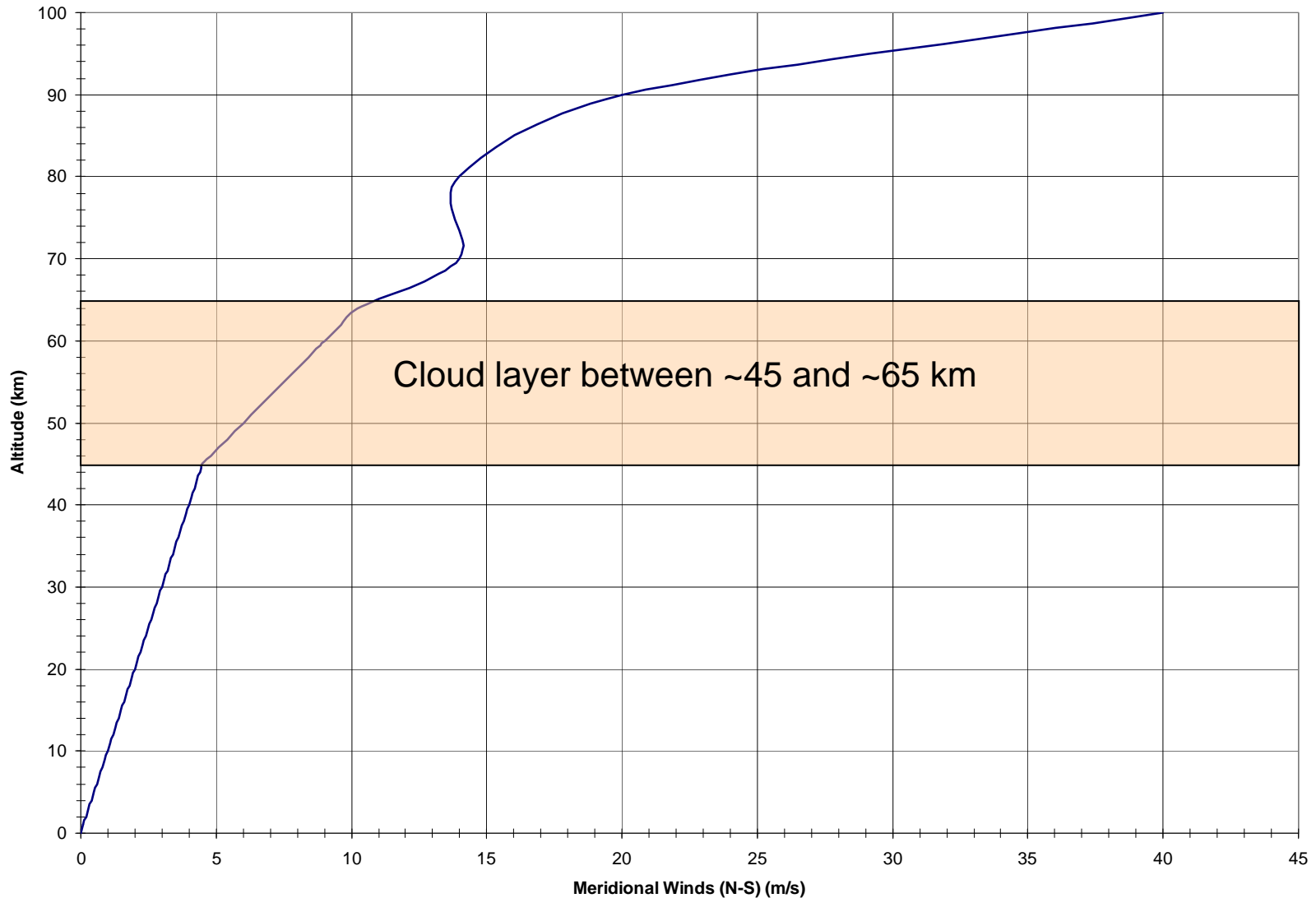
# Venus Zonal Winds



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Advances in Space Research vol.5 no.11, pp 59-83, 1985. (Venus International Reference Atmosphere, Chapter II).

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# Venus Meridional Winds



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# Topographical Map of Venus

