Tennis Serve Angle

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Tennis Ball

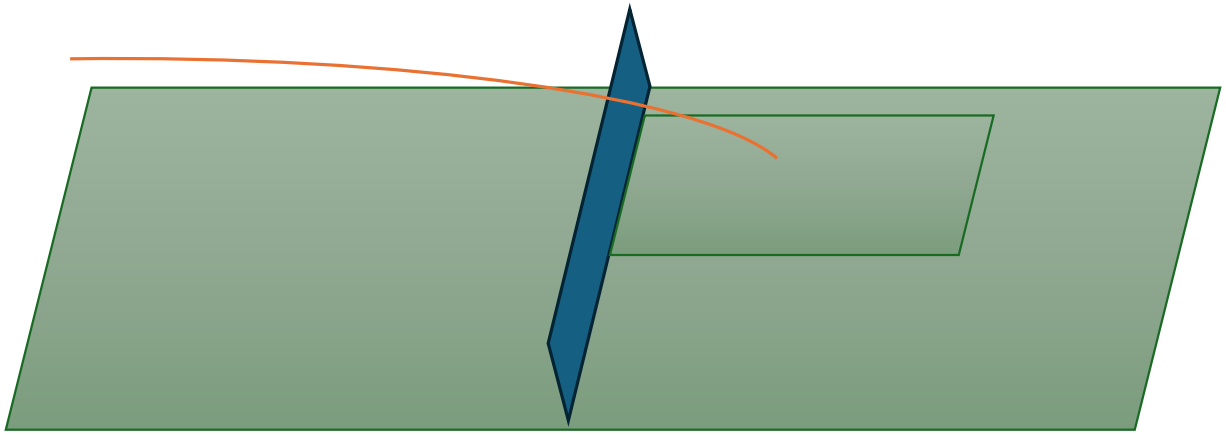
- Weight: 1.98-2.10 oz or ~0.125 lbf
- Diameter: 2.57-2.70 in or ~0.21667 ft
- Thickness: ~3mm or 0.00984252 ft of rubber

Initial conditions

- The average first serve speed or Stefanos Tsitsipas is 122 mph or ~178.933 ft/s
- His average second serve speed is 96 mph or ~140.8 ft/s
- The ball is served at 9 ft off the ground
- Assuming the ball is served at the US Open in Queens, NY at sea level.

What angle must the ball be served at to make it in the service box?

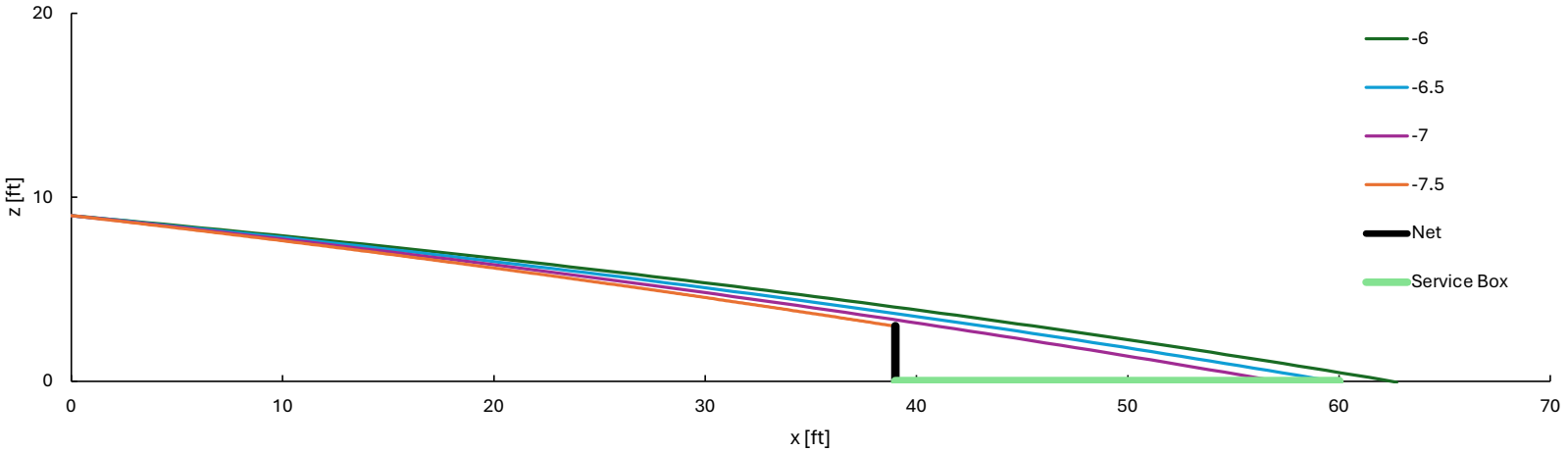
- The net is located 39 ft from the baseline and is 3 ft tall
- The service box is 21 ft long and ends at 60 ft from the baseline



Results

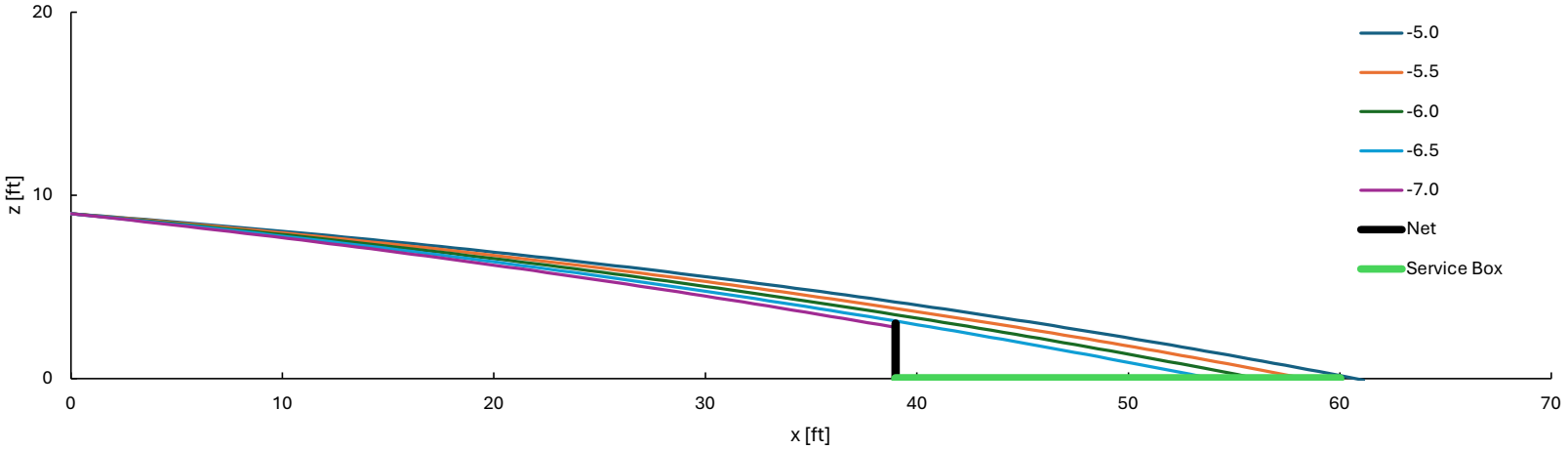
First Serve
122 mph

~ 1 deg window



Second Serve
96 mph

~ 1.5 deg window



Conclusions

- The first serve requires a great degree of precision to make the ball land in the service box.
- Lowering the speed for the second serve lowers the required precision.