

# Dynamic Stability

## Lecture 12

ME EN 415

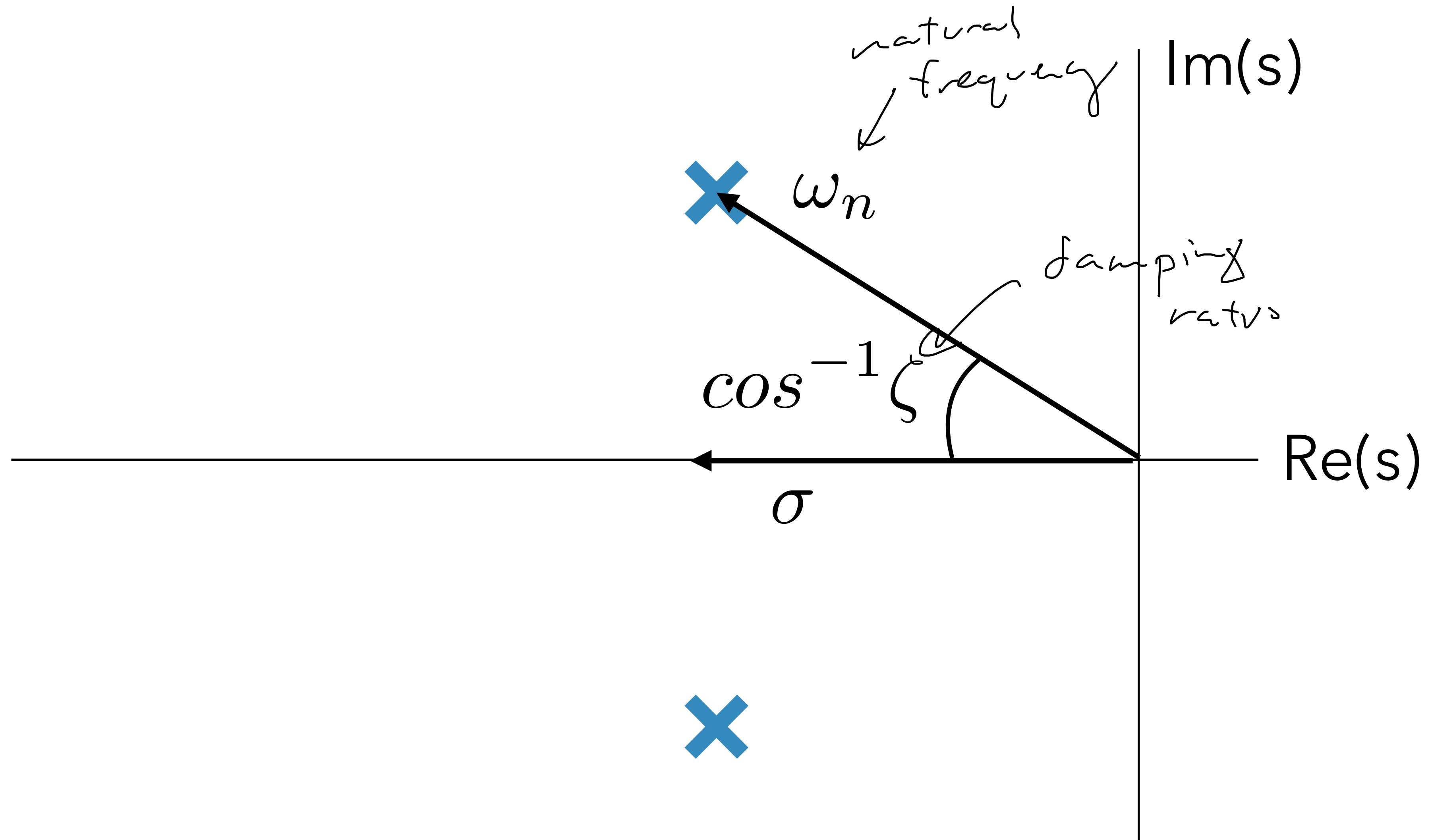
Andrew Ning

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# Eigenvalues Review

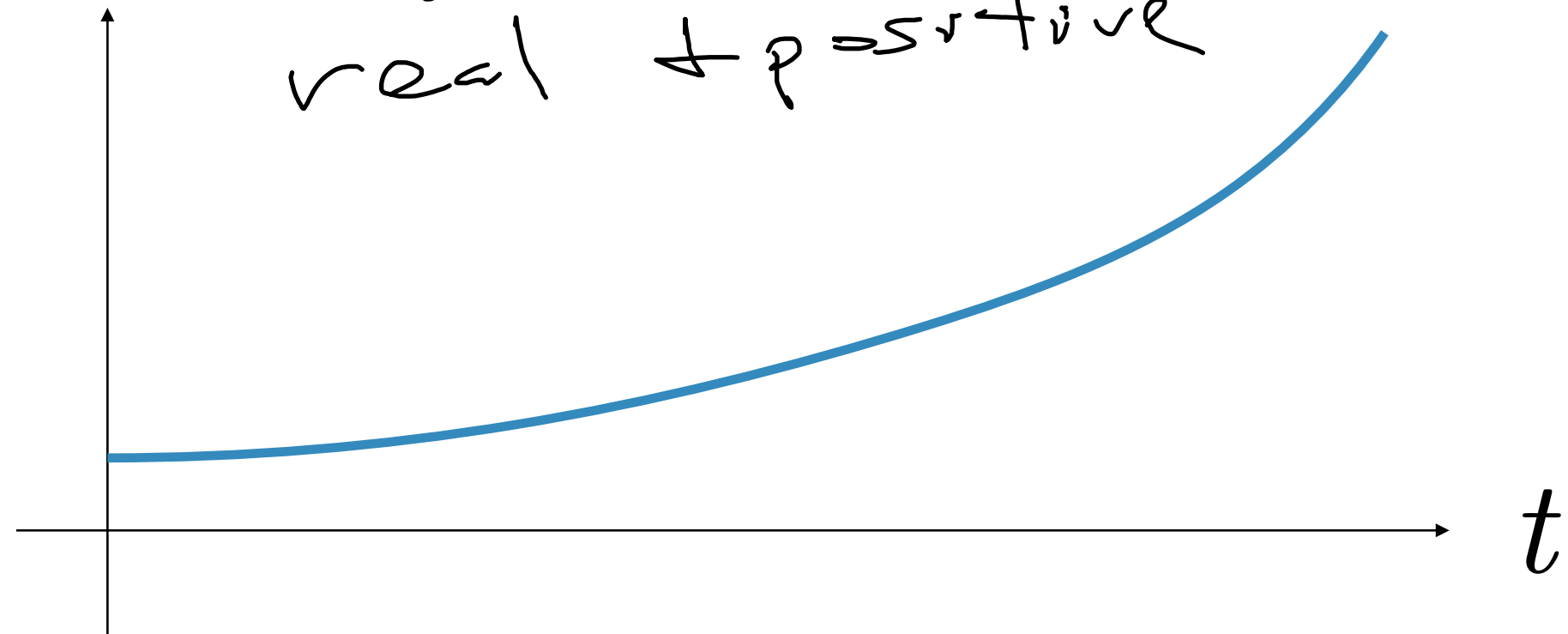
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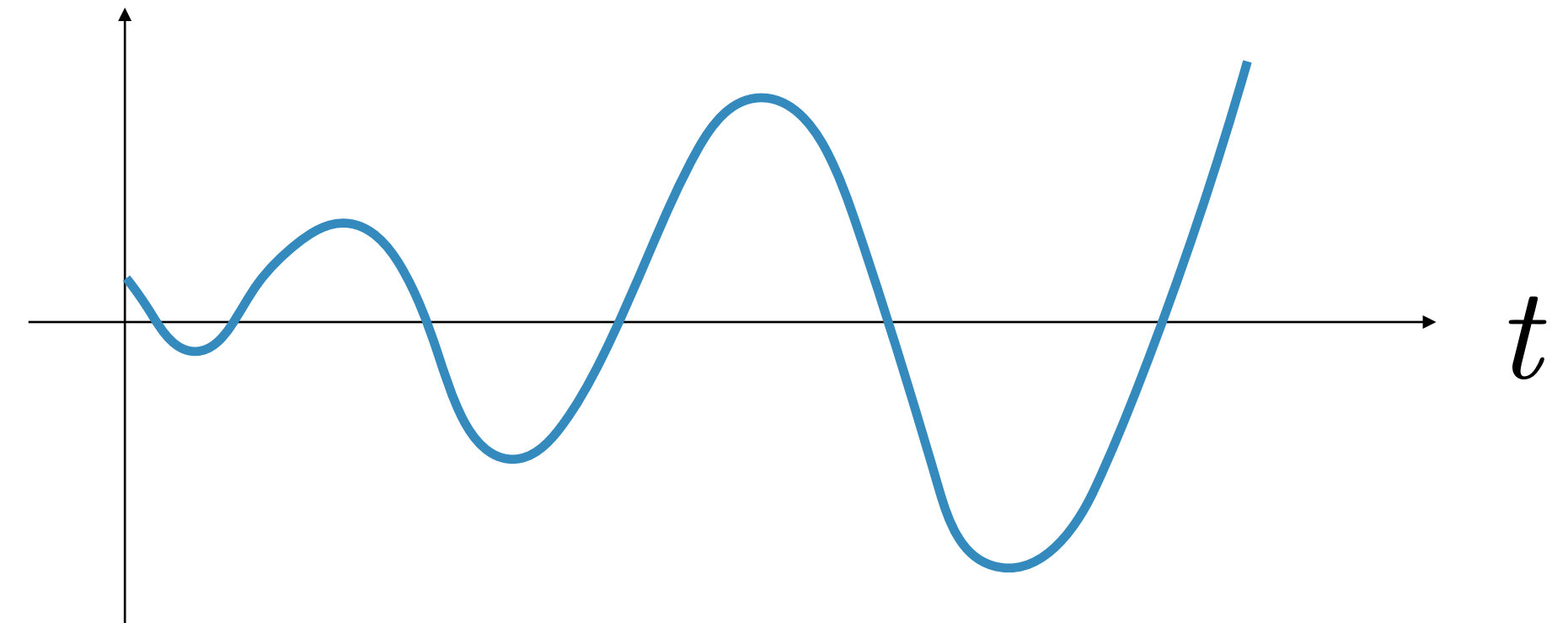
# Stability

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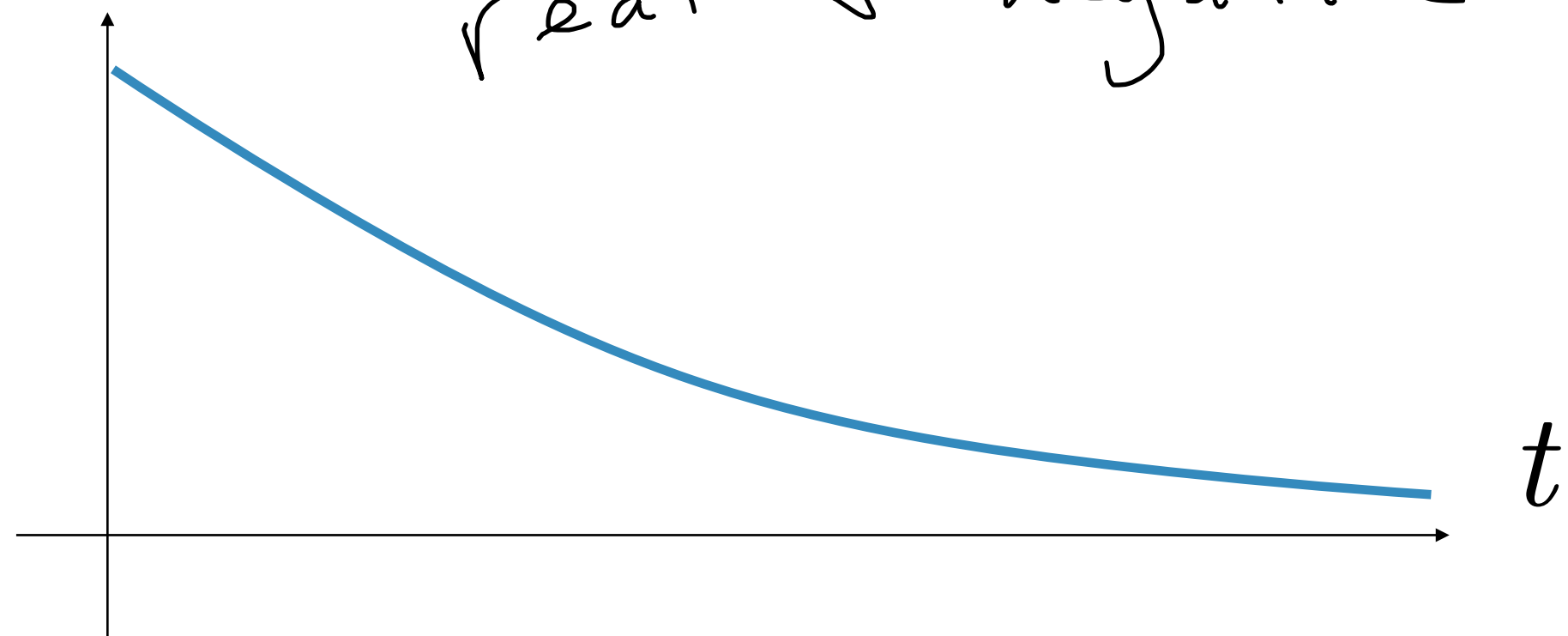
eigenvalues:  
real & positive



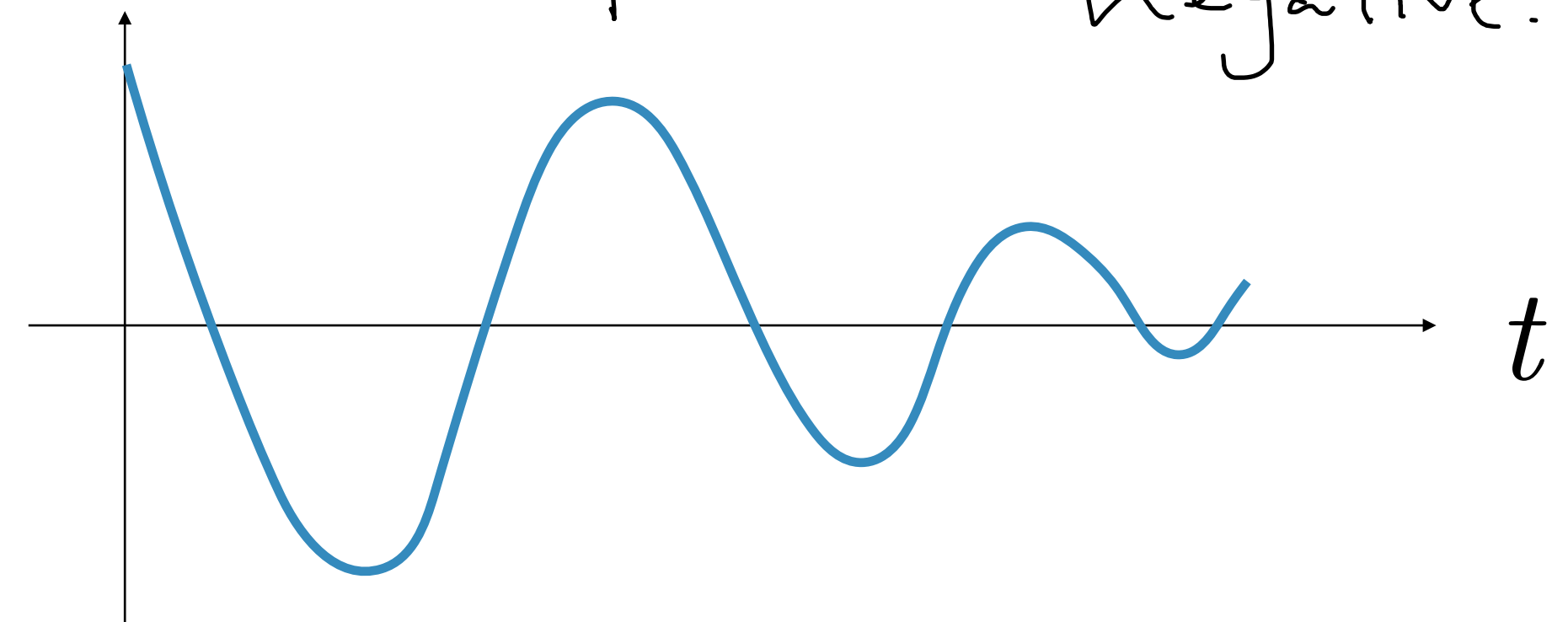
Complex, real part is positive



real & negative

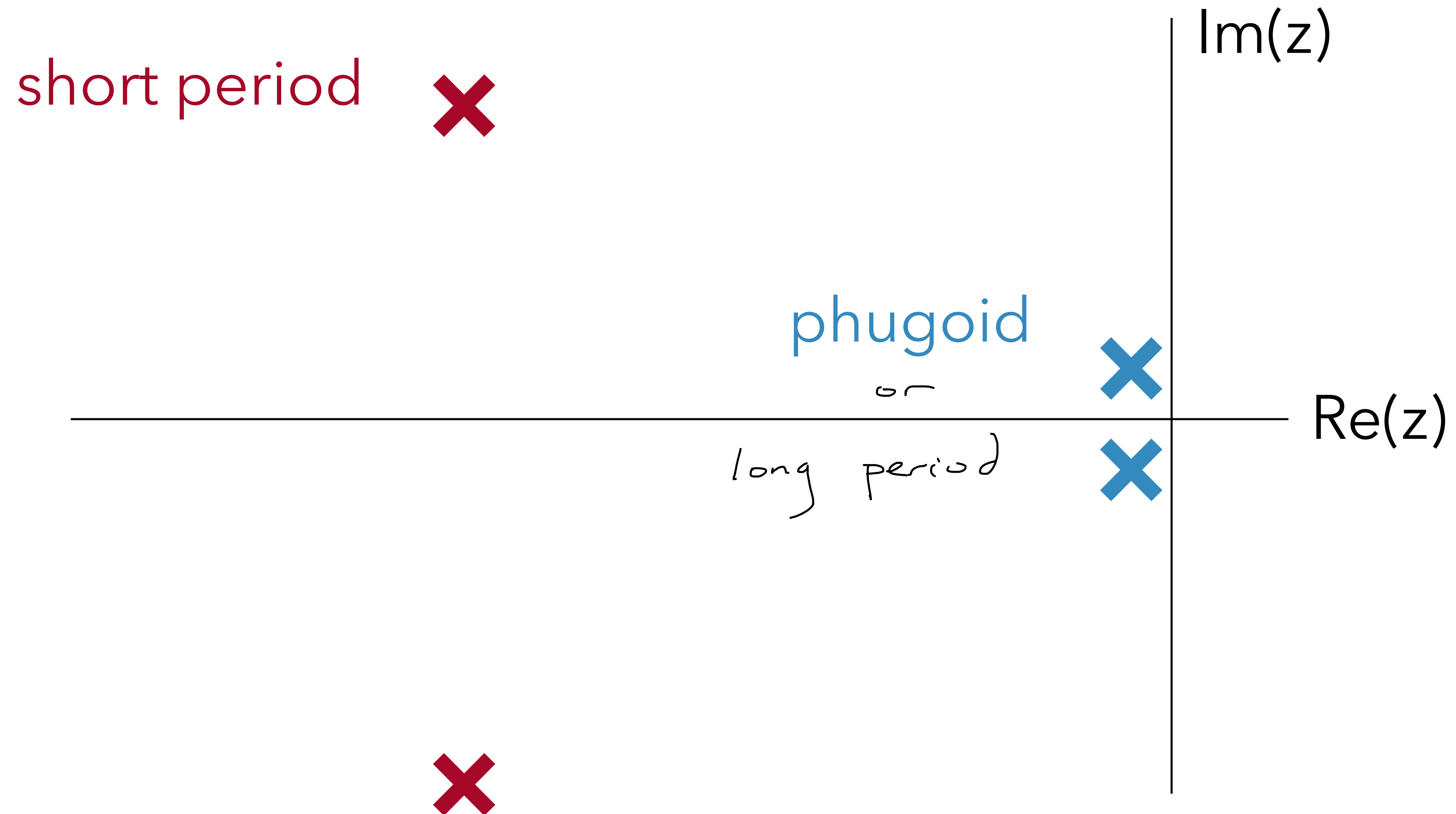


Complex, real part is negative.



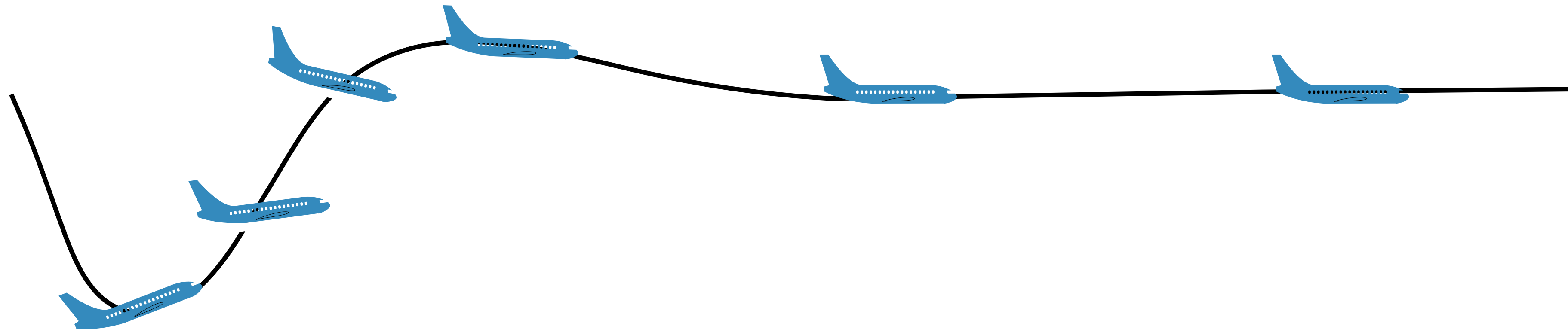
# Longitudinal Dynamics

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# Short Period

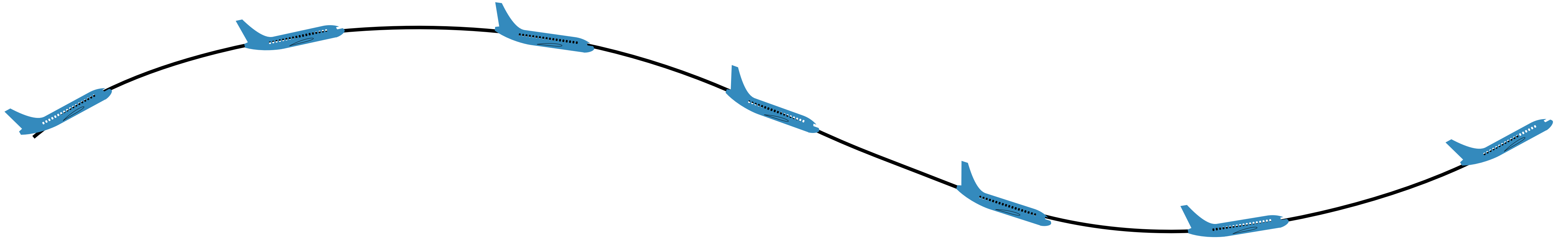
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[https://youtu.be/1O7ZqBS0\\_B8](https://youtu.be/1O7ZqBS0_B8)

# Phugoid

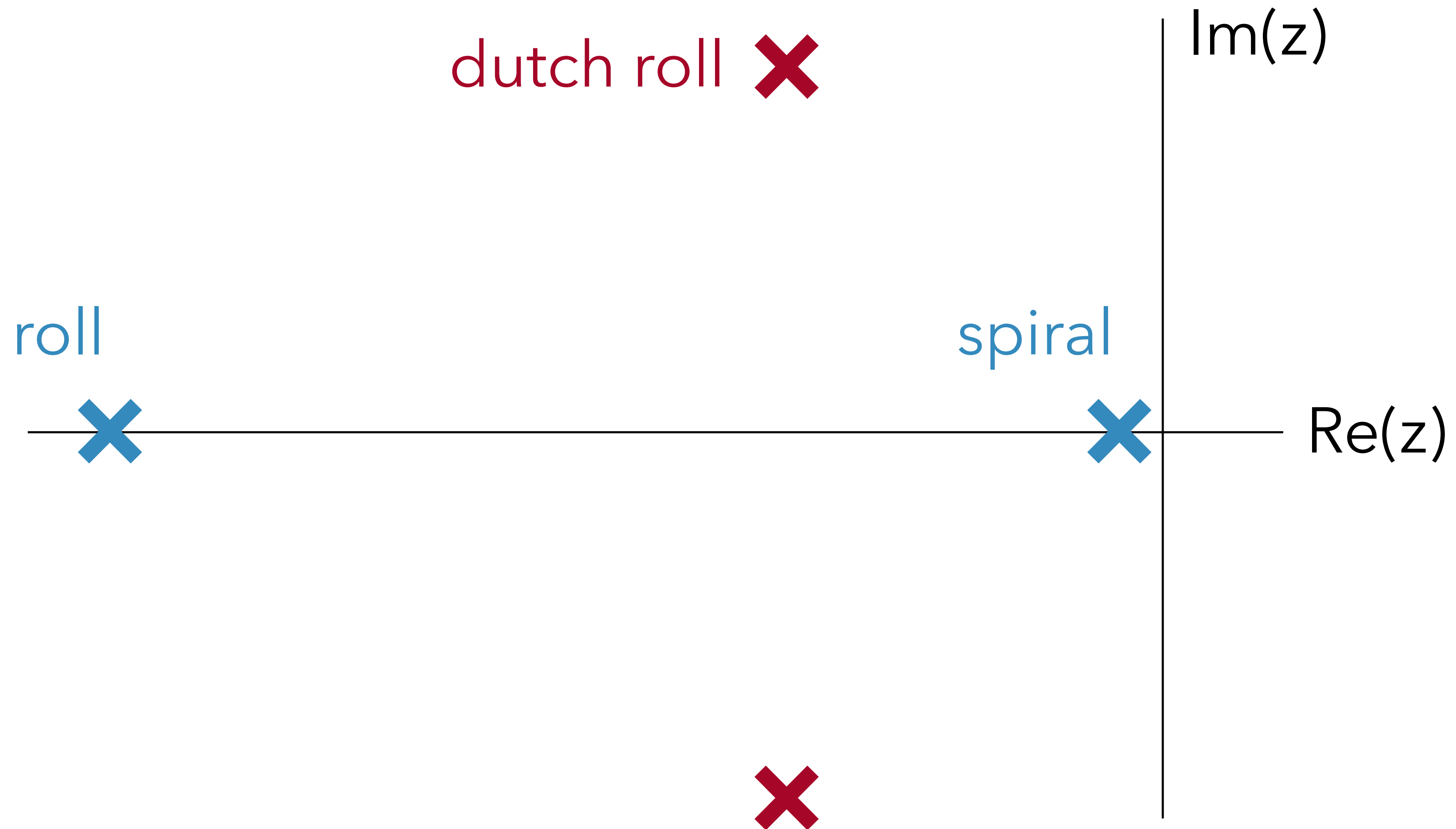
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[https://youtu.be/DEOGM\\_9NGTI](https://youtu.be/DEOGM_9NGTI)

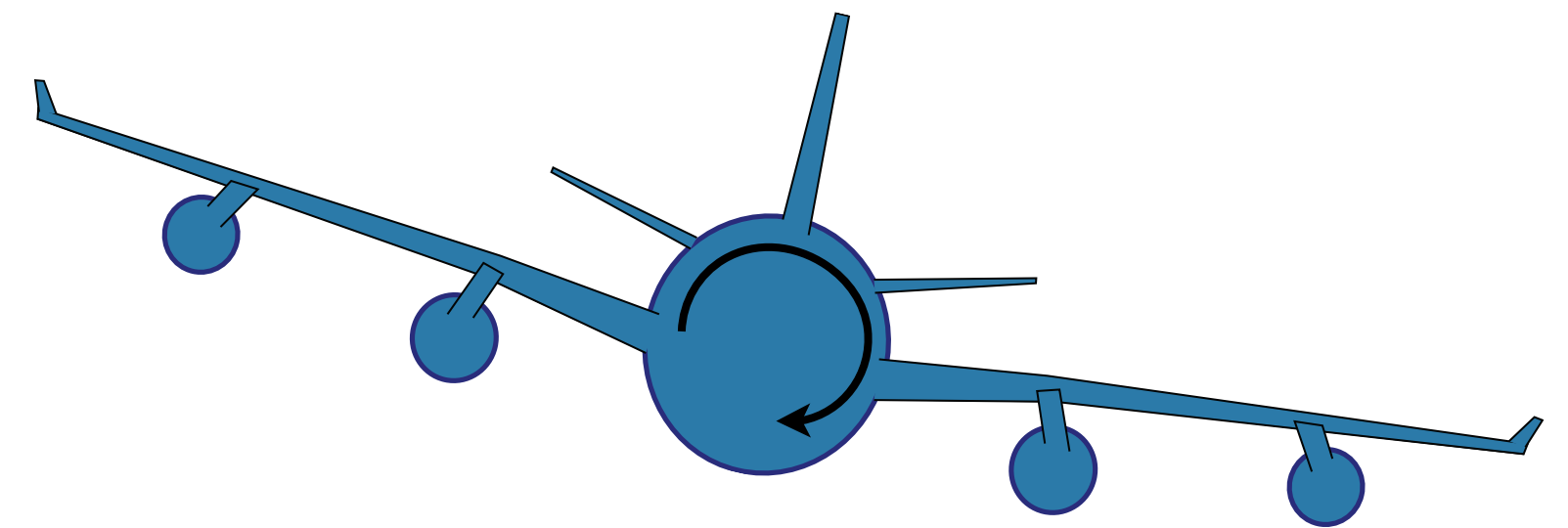
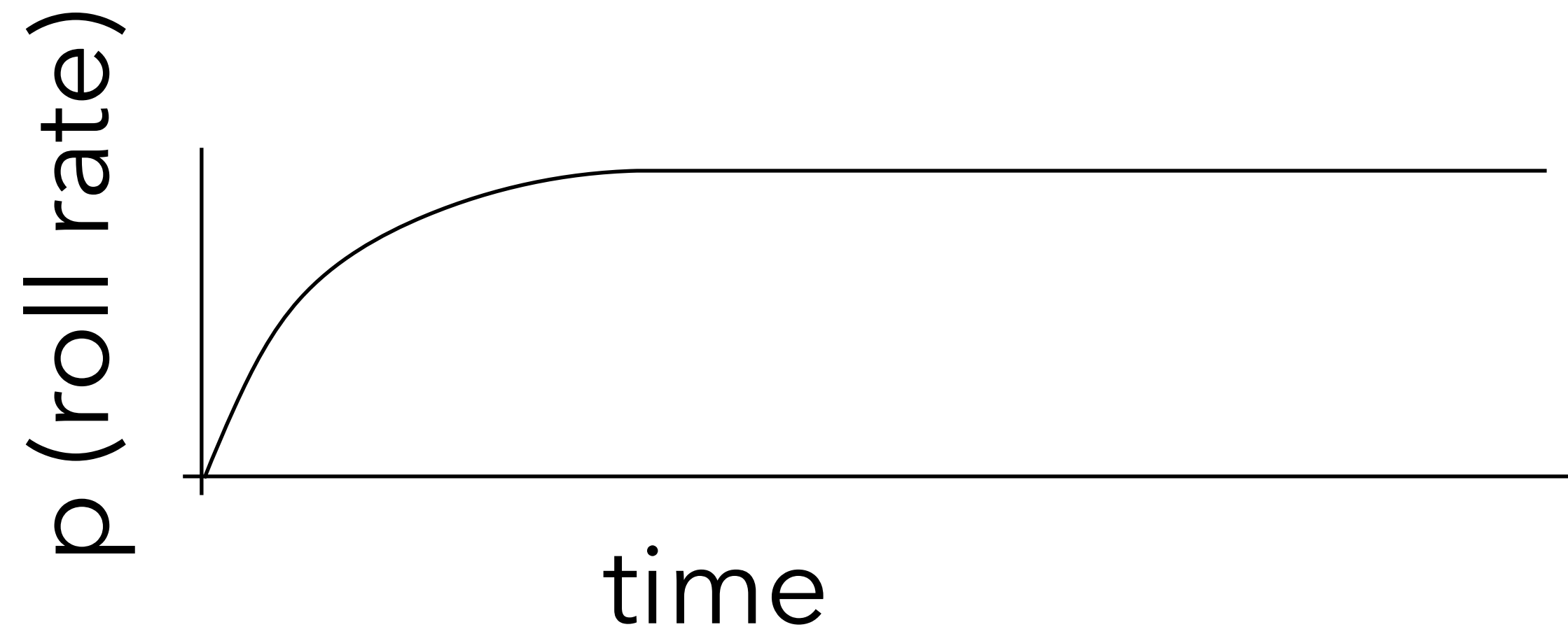
# Lateral Dynamics

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# Roll

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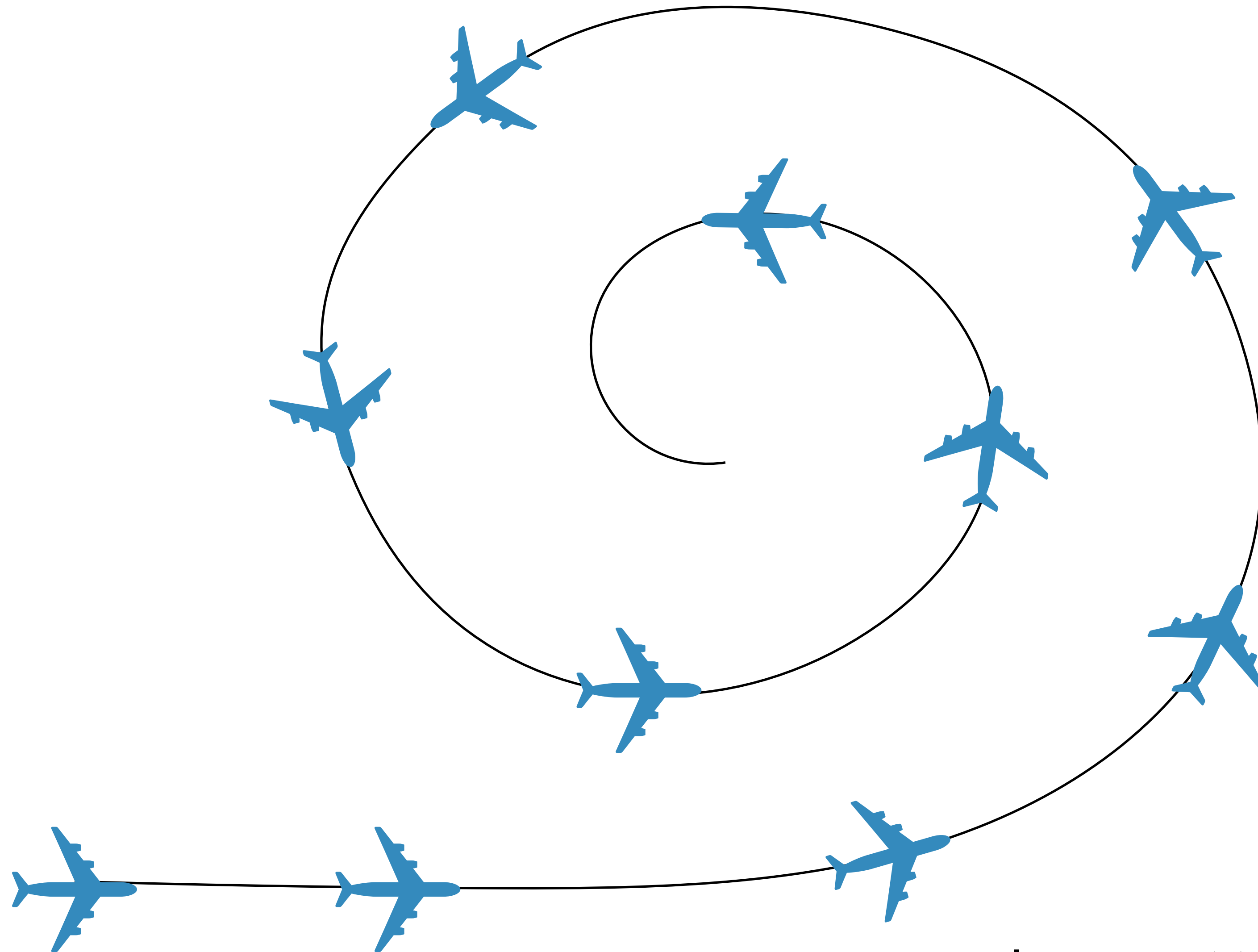


<https://youtu.be/zZQWI2QVwOg>



# Spiral

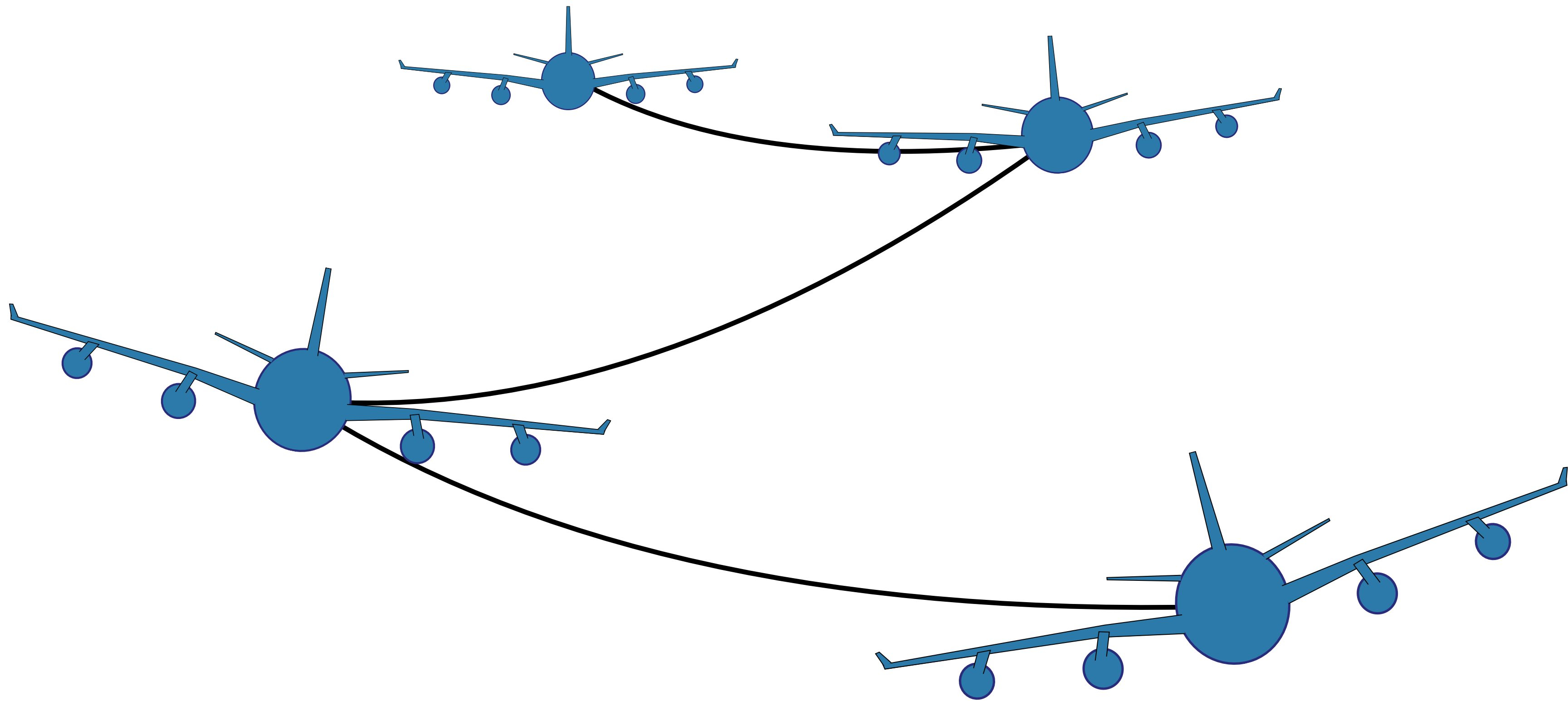
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<https://youtu.be/3PFpHDD7rWY>

# Dutch Roll

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<https://youtu.be/oLe8ajpGNTs>