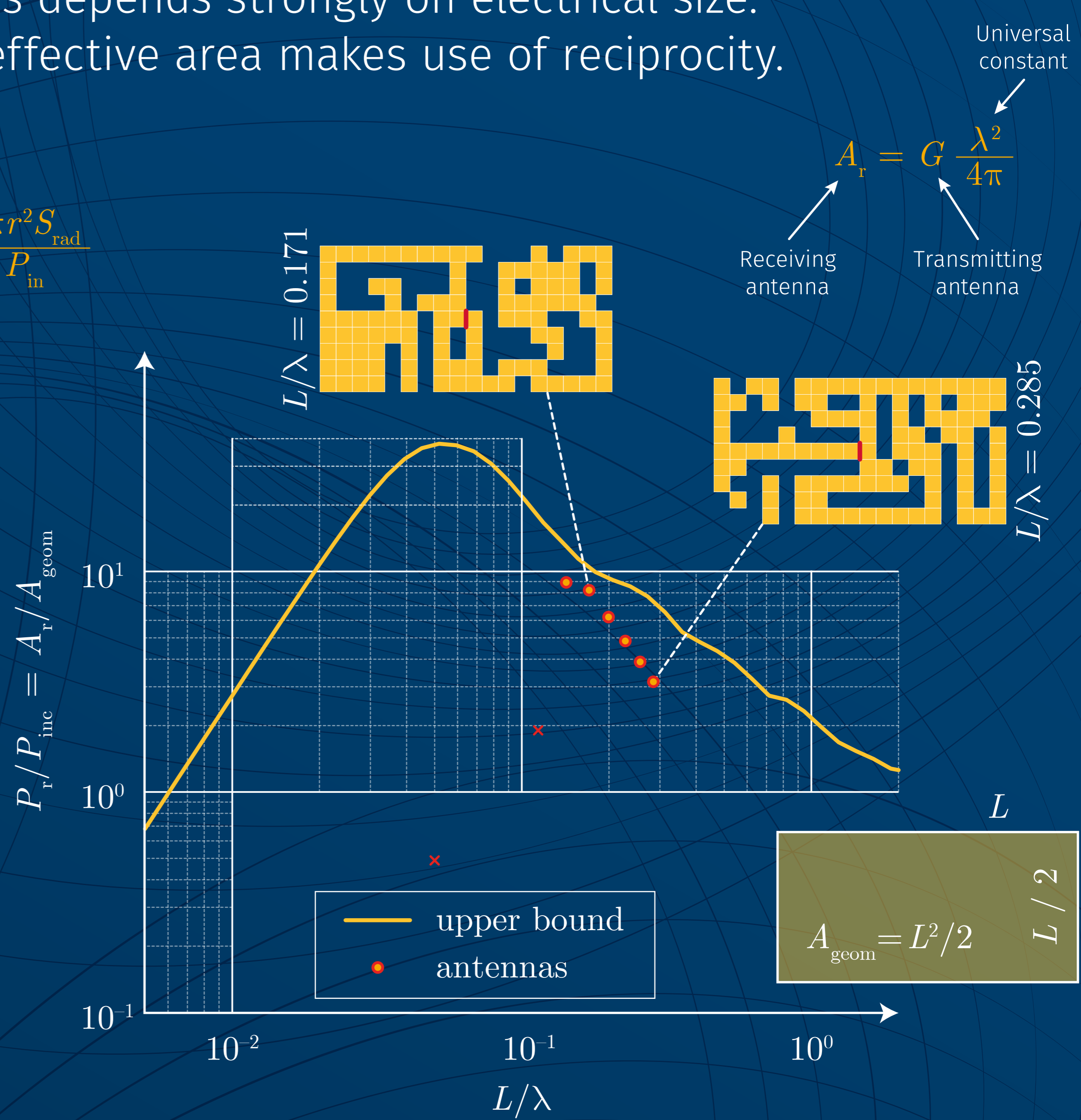
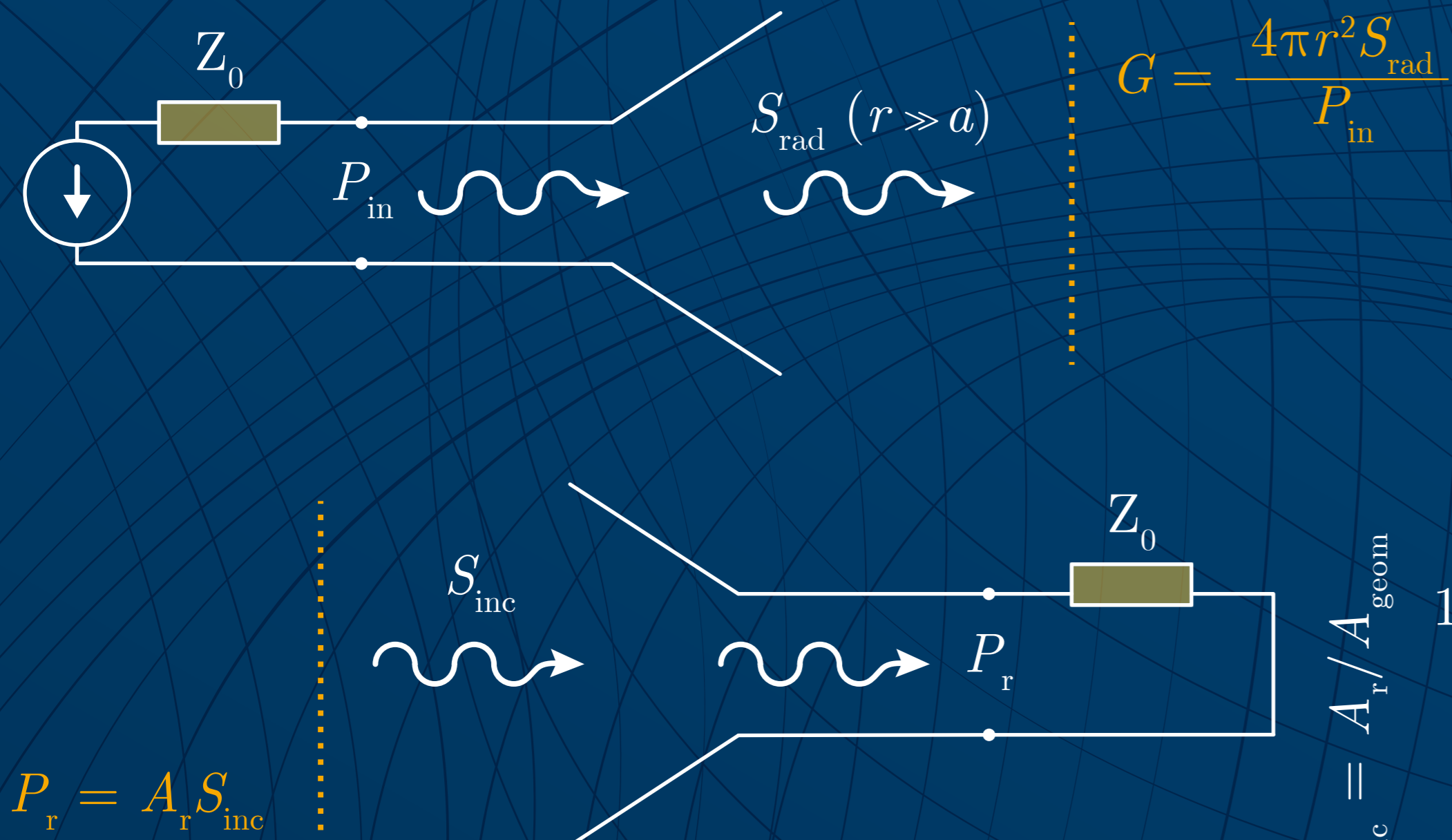


An Optimal Receiving Antenna

Motivation

- Fundamental bounds help engineers to judge the performance of radiating devices.
- Reception performance of antennas depends strongly on electrical size.
- Evaluation of the upper bound to effective area makes use of reciprocity.



maximize $\mathbf{I}^H (2\lambda^2 / A_{\text{geom}}) \mathbf{U} \mathbf{I}$
 subject to $\mathbf{I}^H \mathbf{X} \mathbf{I} = 0$
 $\mathbf{I}^H (\mathbf{R} + \mathbf{L}) \mathbf{I} = 1$

Challenge

- Try to meet the bounds with your antenna!
- Antenna is fed in the middle.



Interactive MATLAB antenna designer powered by AToM.

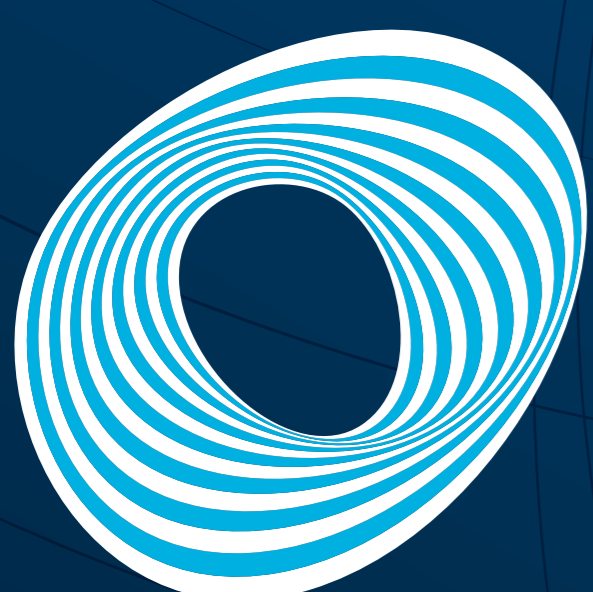
Did you know that?

...it takes a few seconds to calculate the bound, however, it takes more than three hours to find a decent antenna candidate from the pool of 2^{160} ($\approx 1.5 \cdot 10^{48}$) candidates.

Learn more at...

| CEM Group | elmag.org/CEM

| Other topics: stored energy, characteristic modes, Q-factor



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