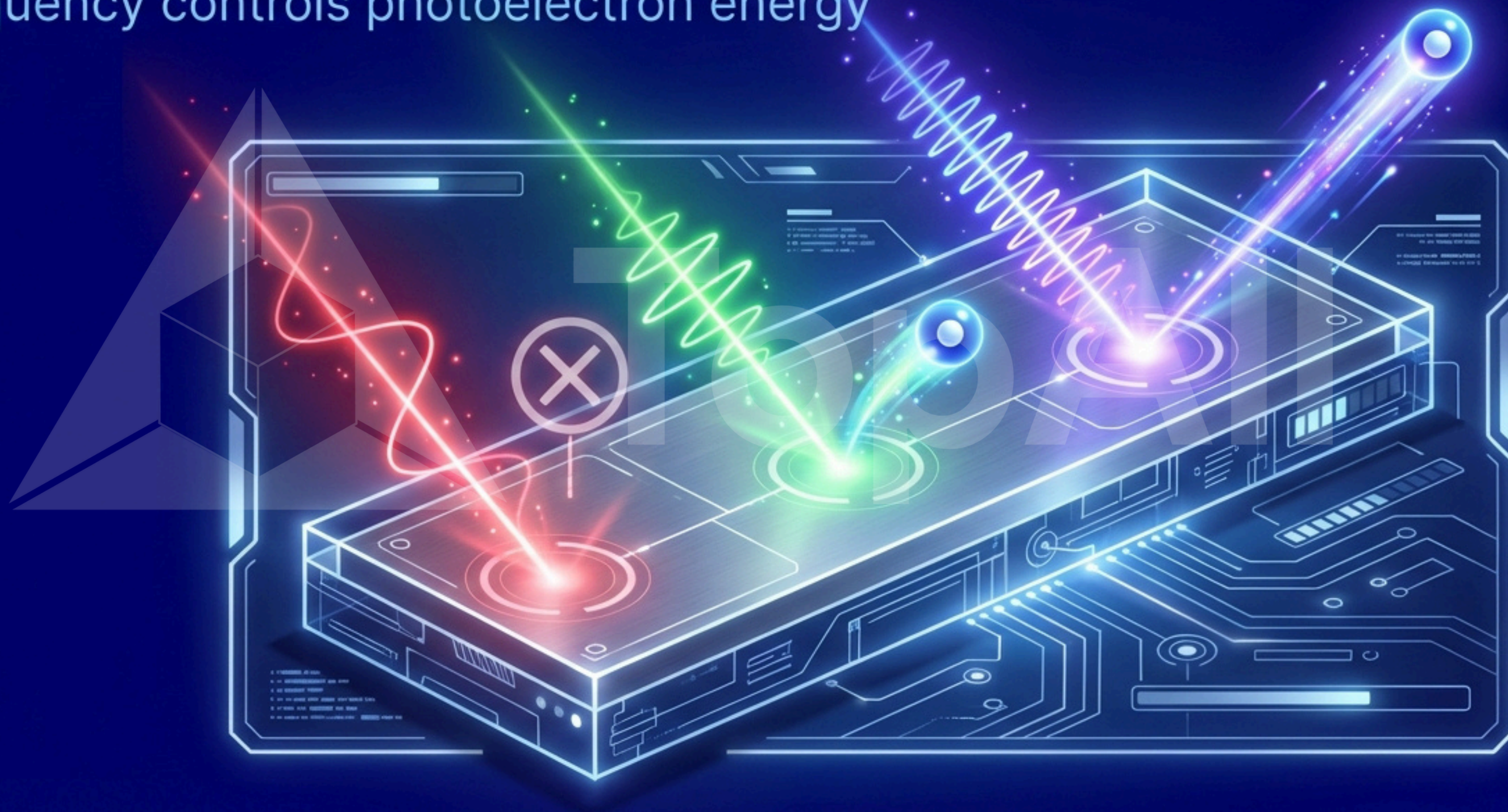


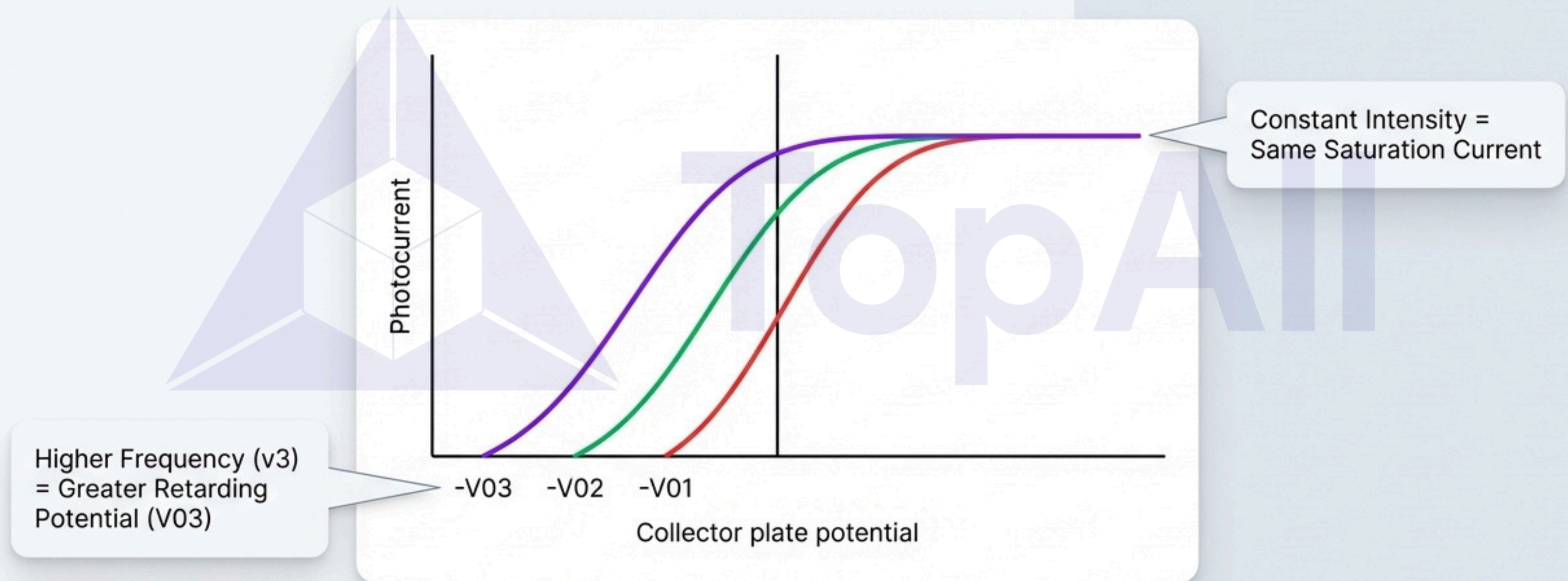
Frequency vs Stopping Potential

Why frequency controls photoelectron energy



The Experimental Reality

Higher frequency light results in more energetic photoelectrons, requiring a more negative potential to stop them completely.

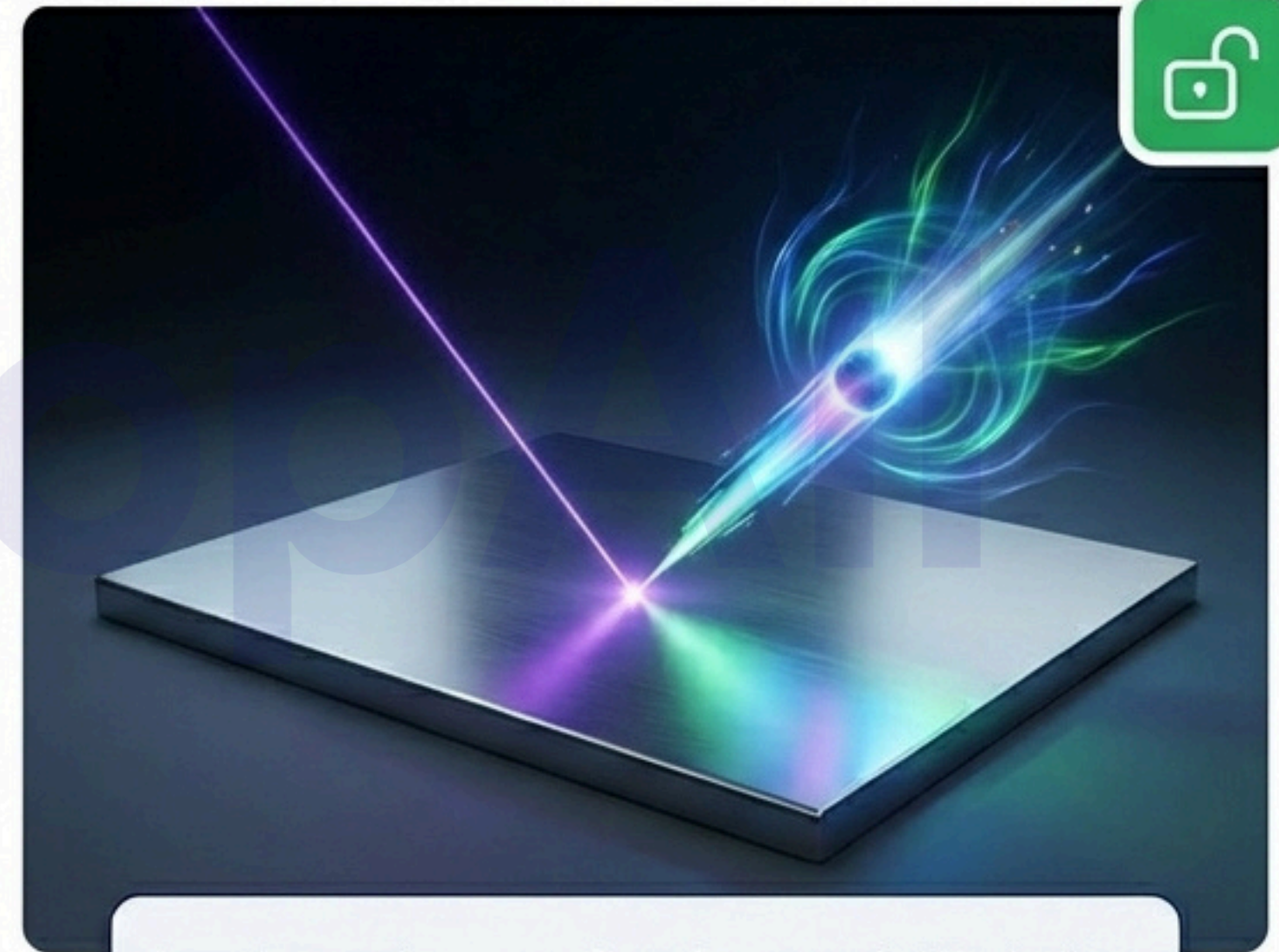


The Ultimate Constraint: Threshold Frequency (ν_0)

Below this frequency, no emission occurs—no matter how intense the light is.



High Intensity, $\nu < \nu_0 \rightarrow$ Zero Emission



Low Intensity, $\nu > \nu_0 \rightarrow$ Successful Emission



You've Learned the Theory. Let's Test Them Now.

$$E=mc^2$$



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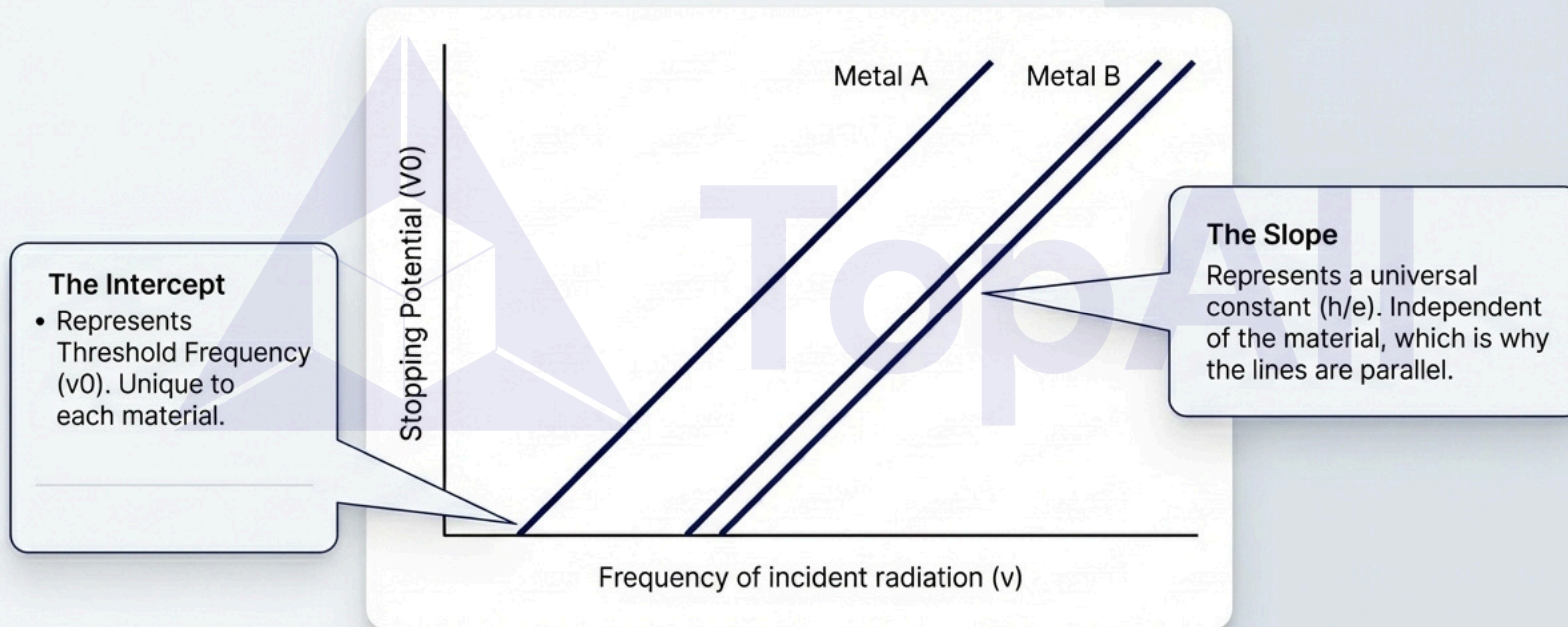
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The Mathematical Pattern

Stopping potential varies linearly with frequency



The Astonishing Reality: Instantaneous Emission

Above the threshold, emission starts instantaneously. There is no energy pooling or time lag, completely defying classical wave theory.



Exam Synthesis: 3 Absolute Rules



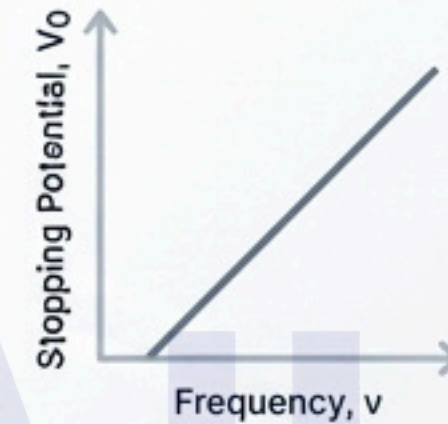
$K_{\max}$ depends strictly on frequency.

The maximum kinetic energy of an emitted electron is dictated by light color/frequency, completely independent of light intensity.



Threshold frequency (v_0) is unique.

Every photosensitive material has a specific minimum frequency required to break the atomic binding forces.



V_0 rises linearly with frequency.

For any frequency above the threshold, the stopping potential (V_0) needed to halt electrons increases in a perfect straight line.



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