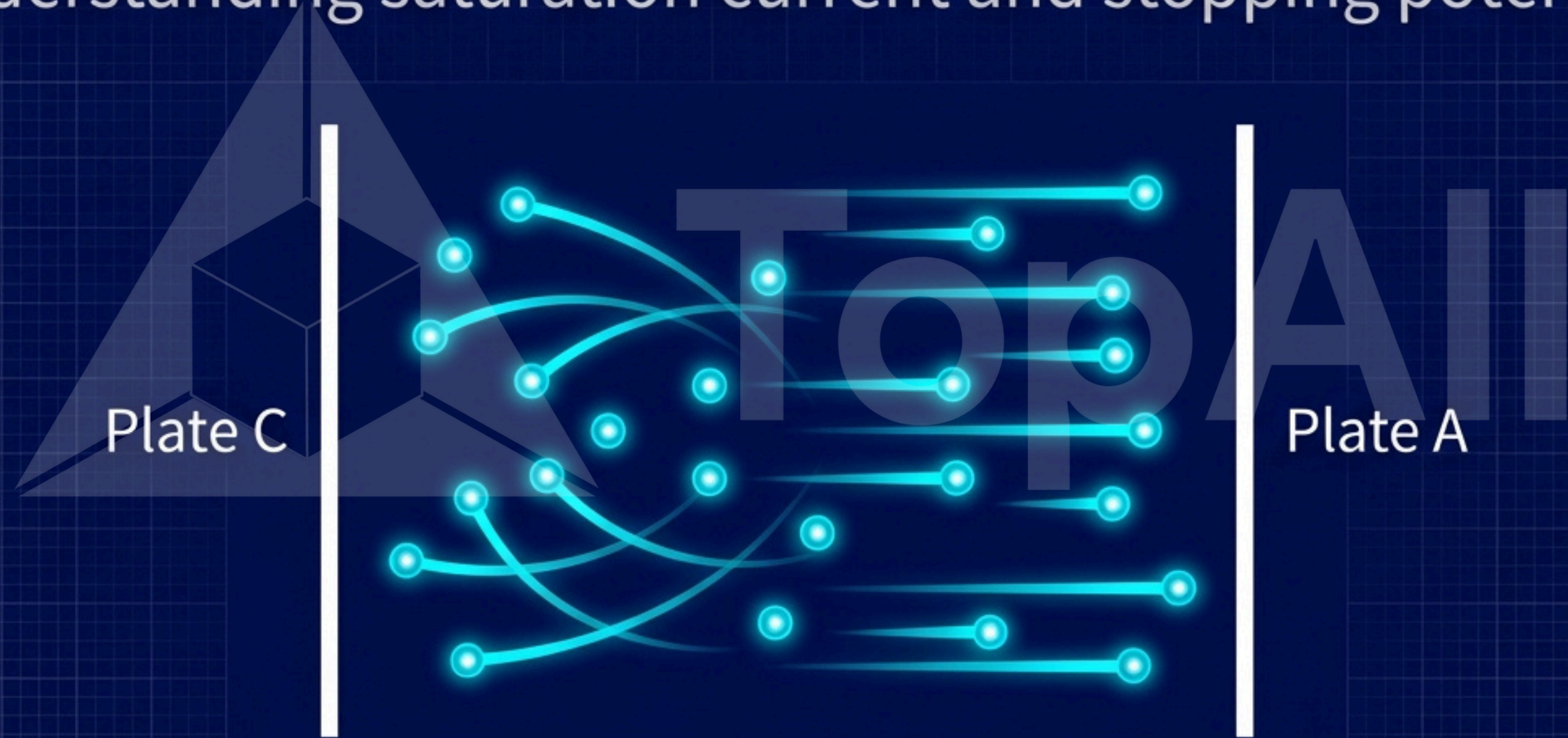


Potential vs Photoelectric Current

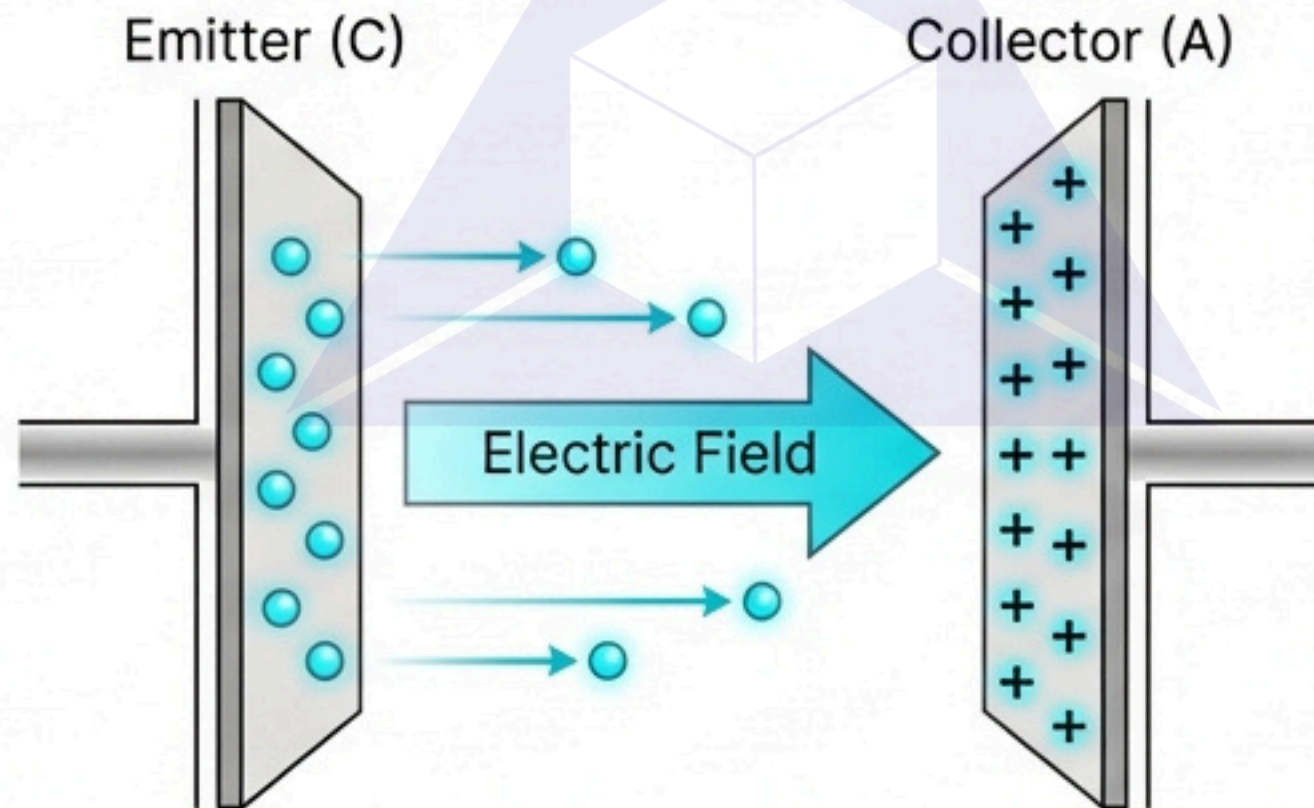
Understanding saturation current and stopping potential



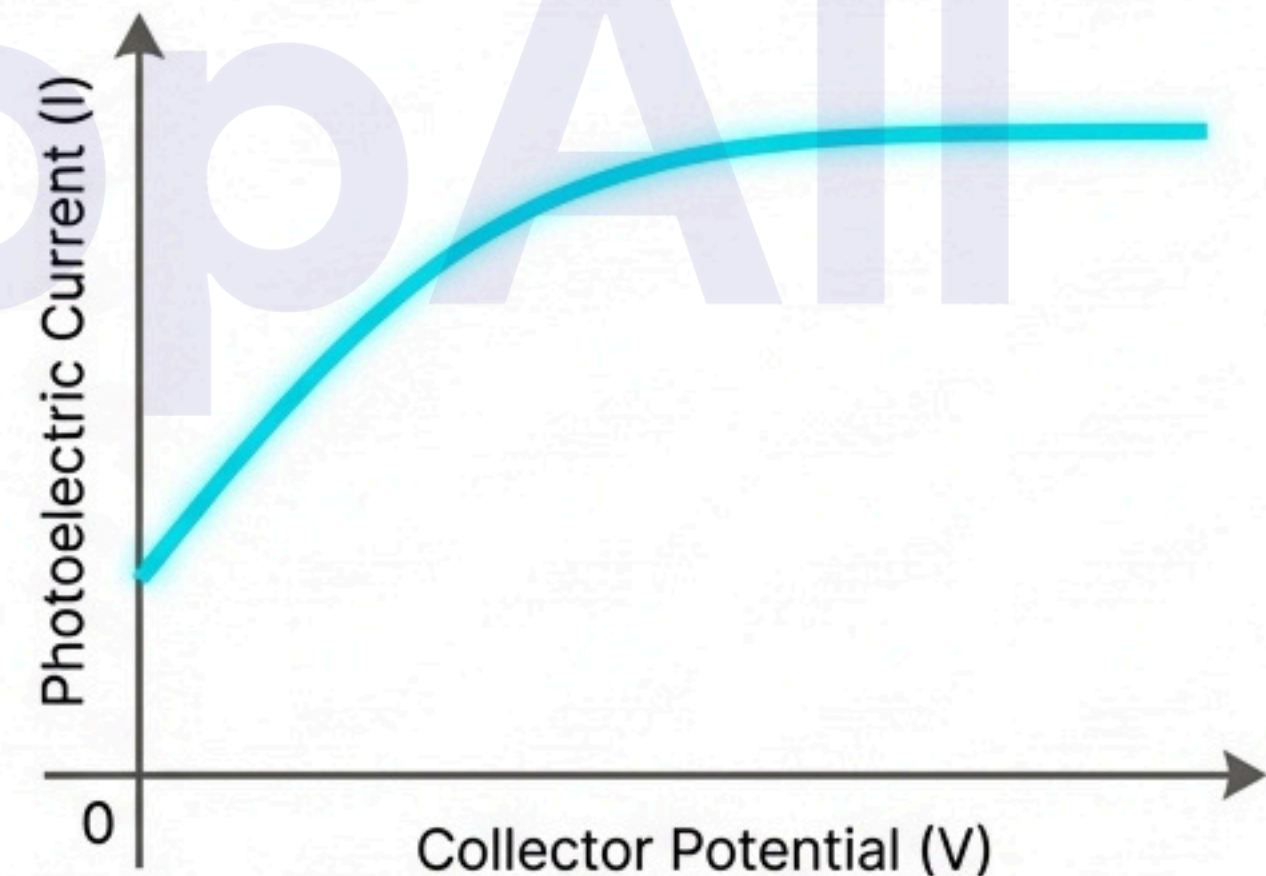
Accelerating the Photoelectrons

When the collector plate (A) is kept at a positive potential relative to the emitter (C), it actively attracts the emitted photoelectrons. As this positive, accelerating potential increases, more electrons are successfully pulled across the gap, causing the photoelectric current to rise.

The Physical Model



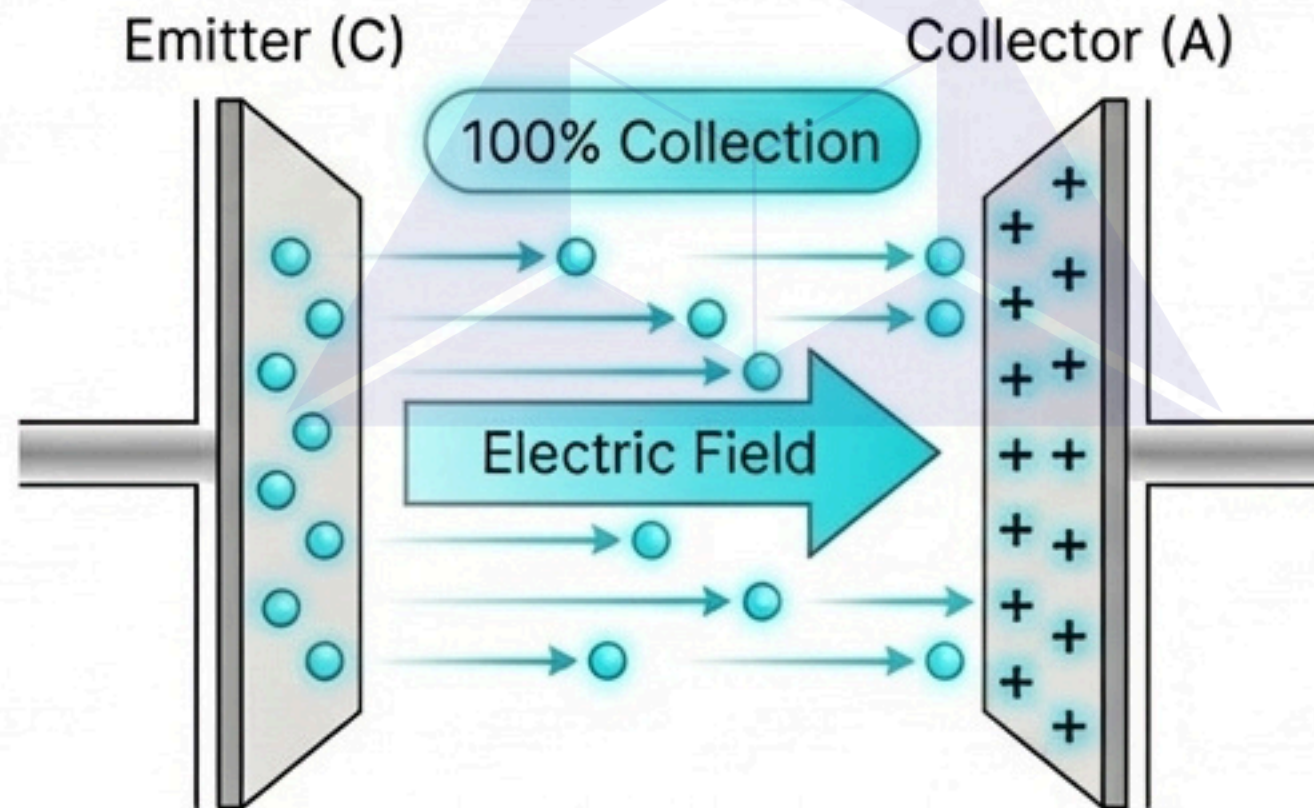
The Data Model



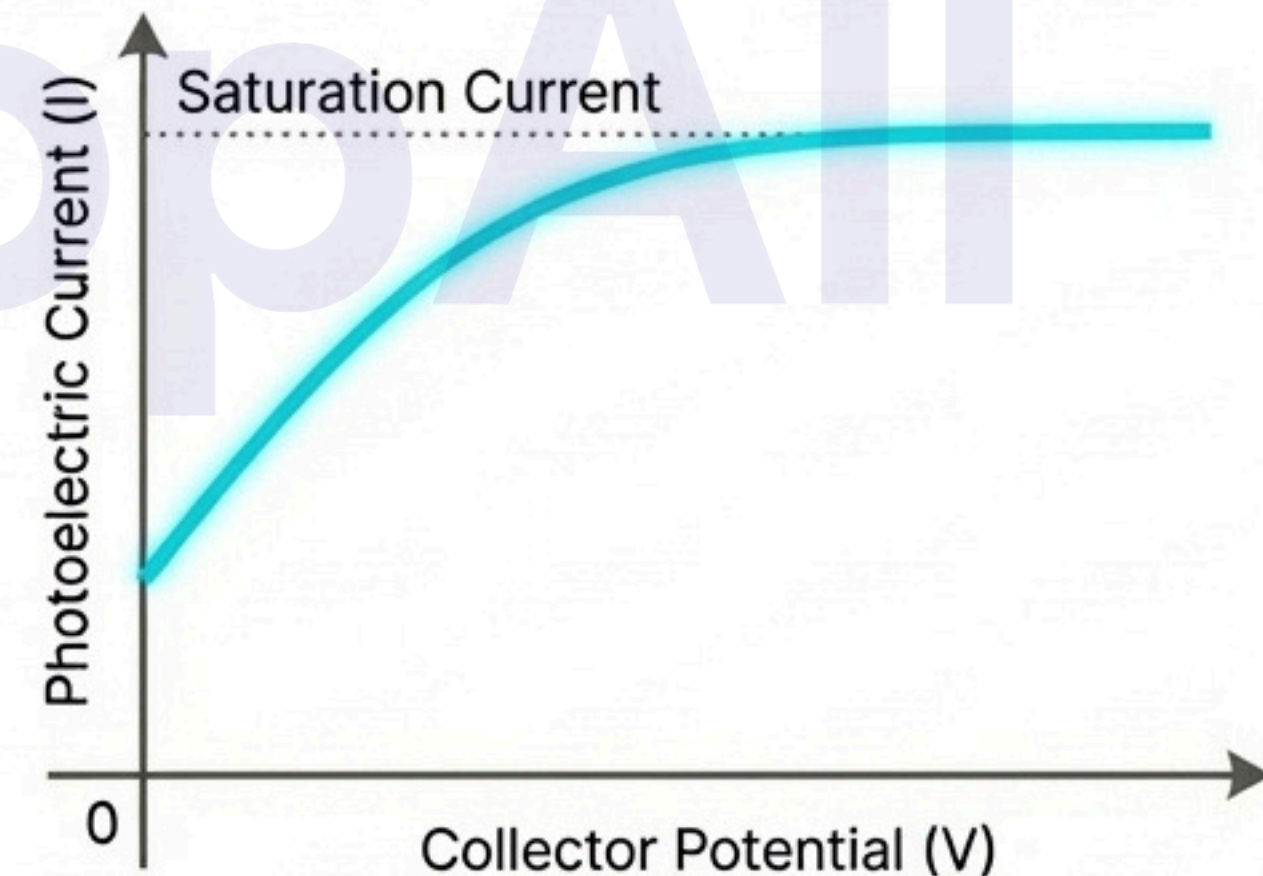
Reaching Saturation

If we continue increasing the positive potential, the current eventually stops growing. This maximum value is the saturation current. It occurs when the potential is so strong that all photoelectrons emitted by Plate C per second are successfully collected by Plate A.

The Physical Model



The Data Model





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Key Highlights

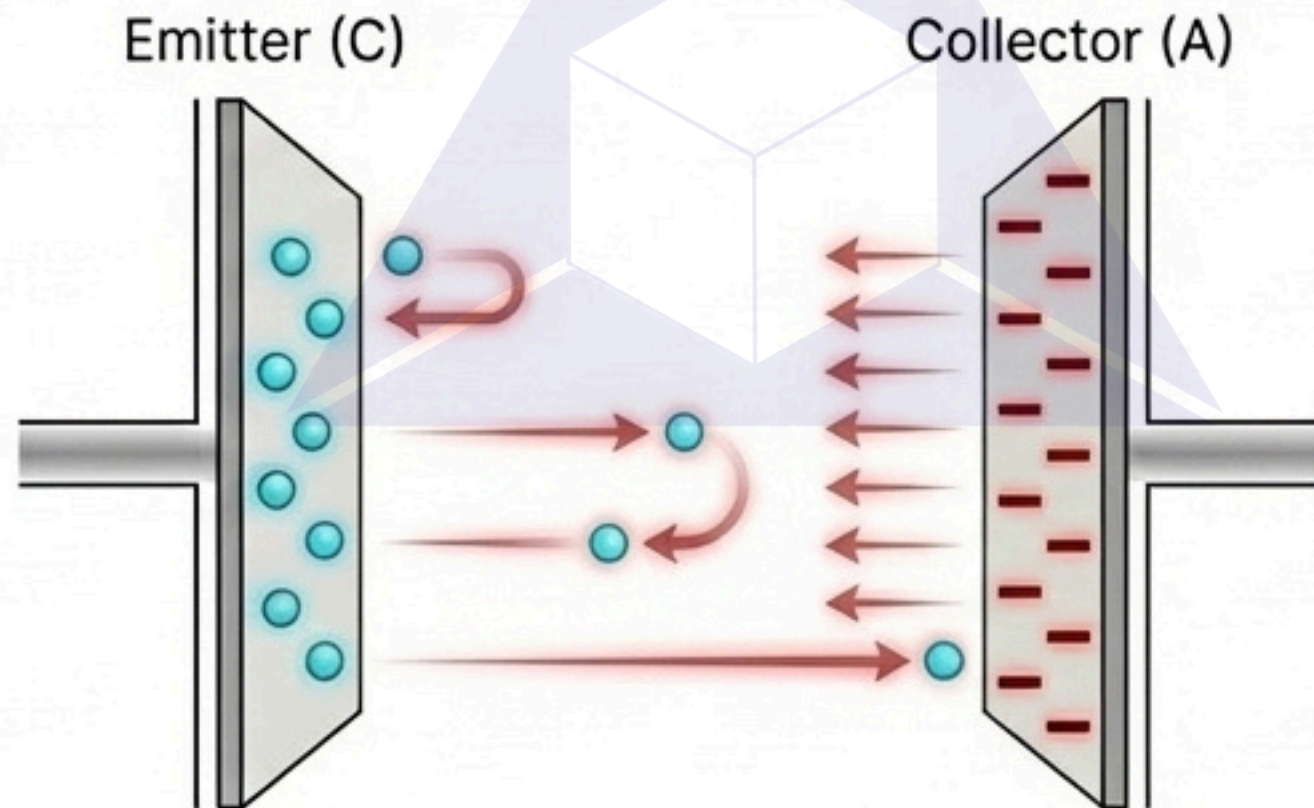
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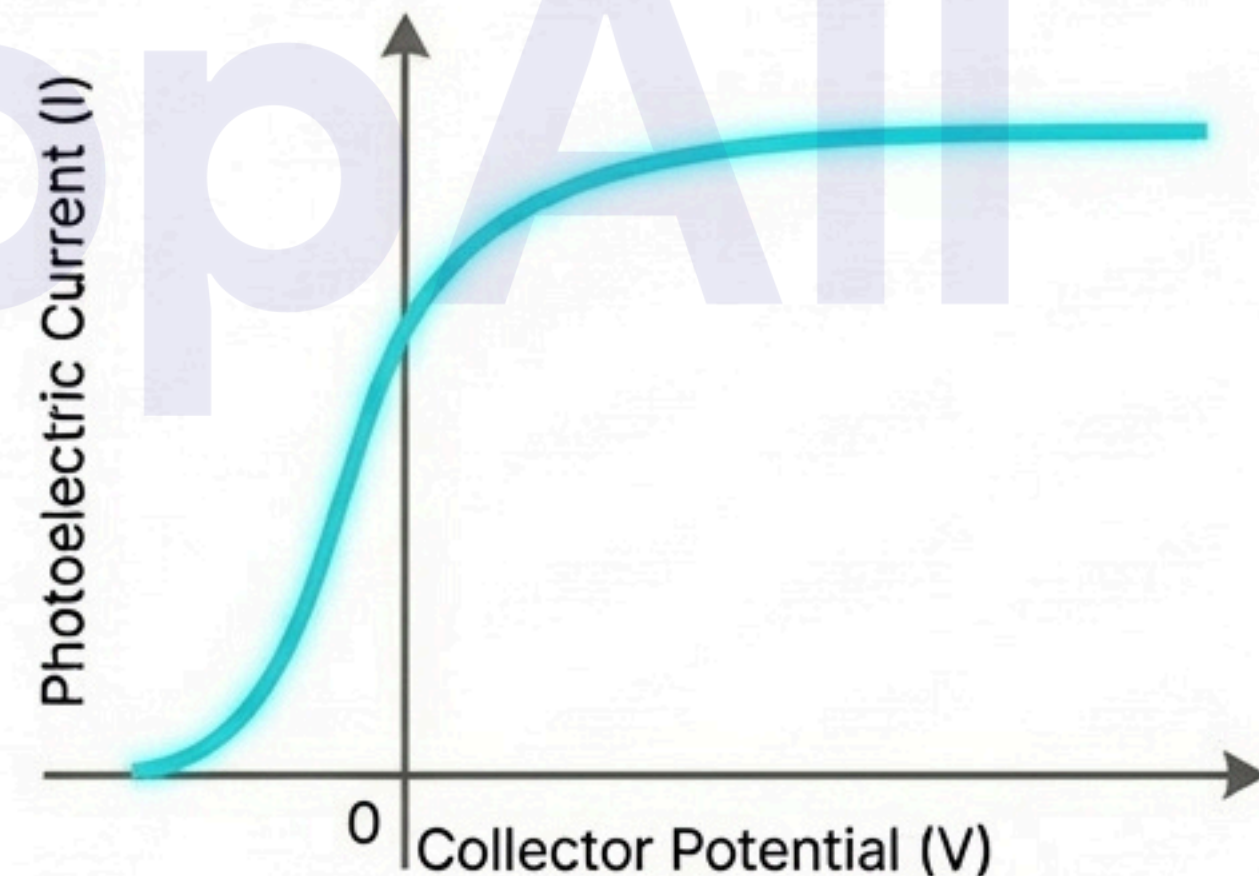
The Retarding Potential

What happens if we reverse the polarity? When Plate A is made negative, it repels the electrons. Only photoelectrons with enough initial kinetic energy can overcome this retarding potential. As Plate A becomes more negative, the current drops rapidly.

The Physical Model



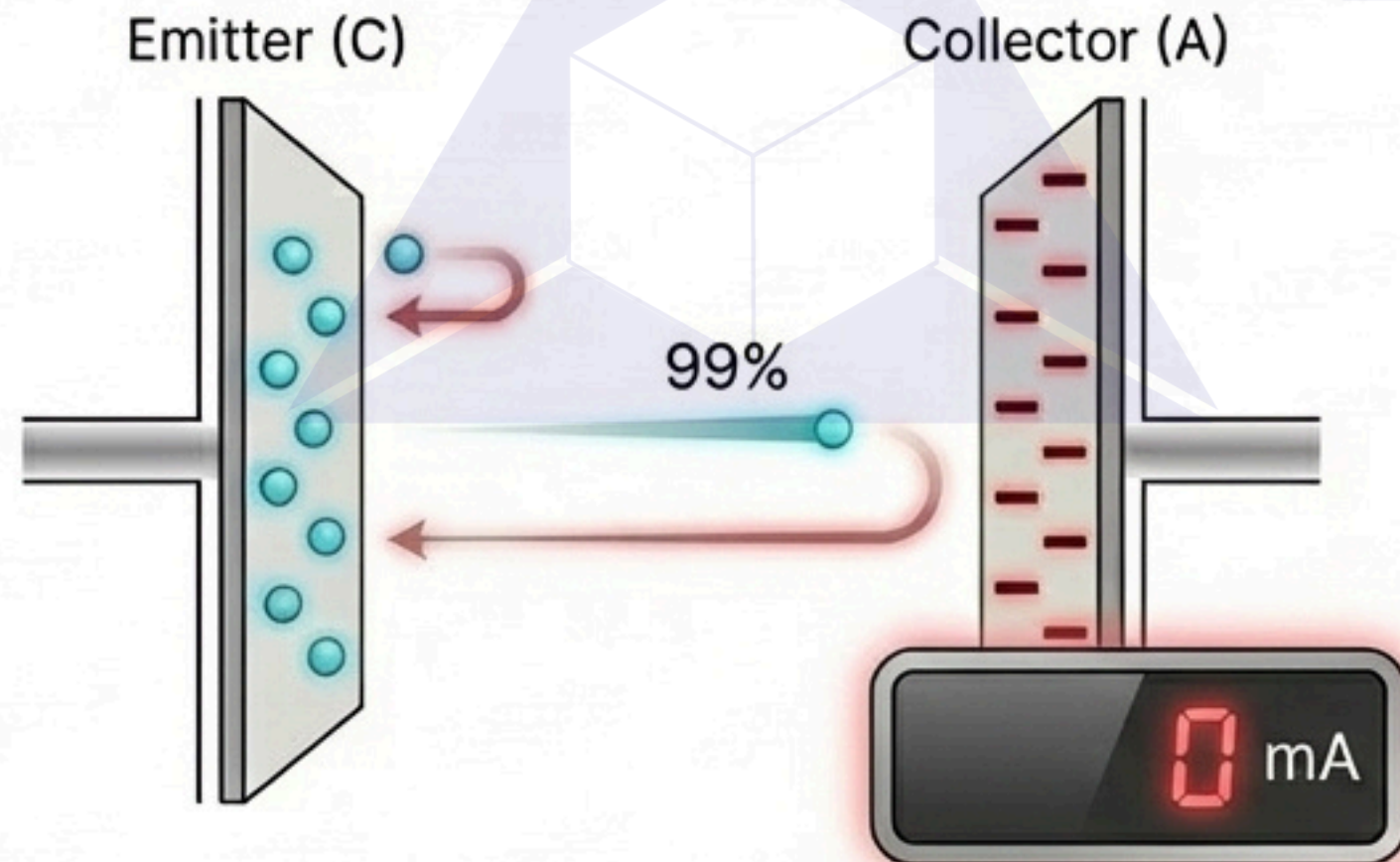
The Data Model



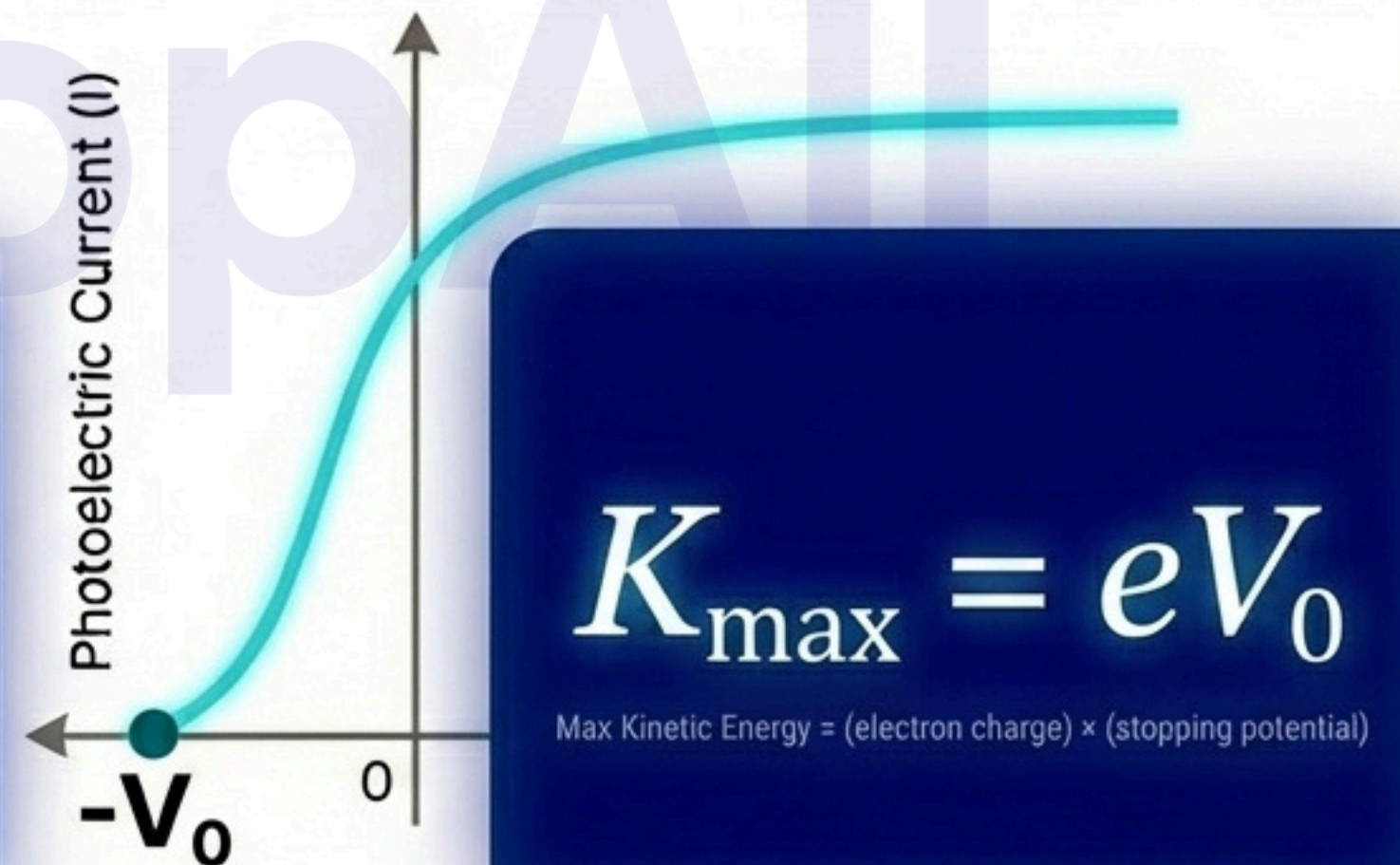
The Stopping Potential ($-V_0$)

At a specific, sharply defined negative potential, even the most energetic electron is repelled just before touching Plate A. The photoelectric current drops to exactly zero. This is the **cut-off** or **stopping potential**.

The Physical Model



The Data Model



Synthesizing the Data

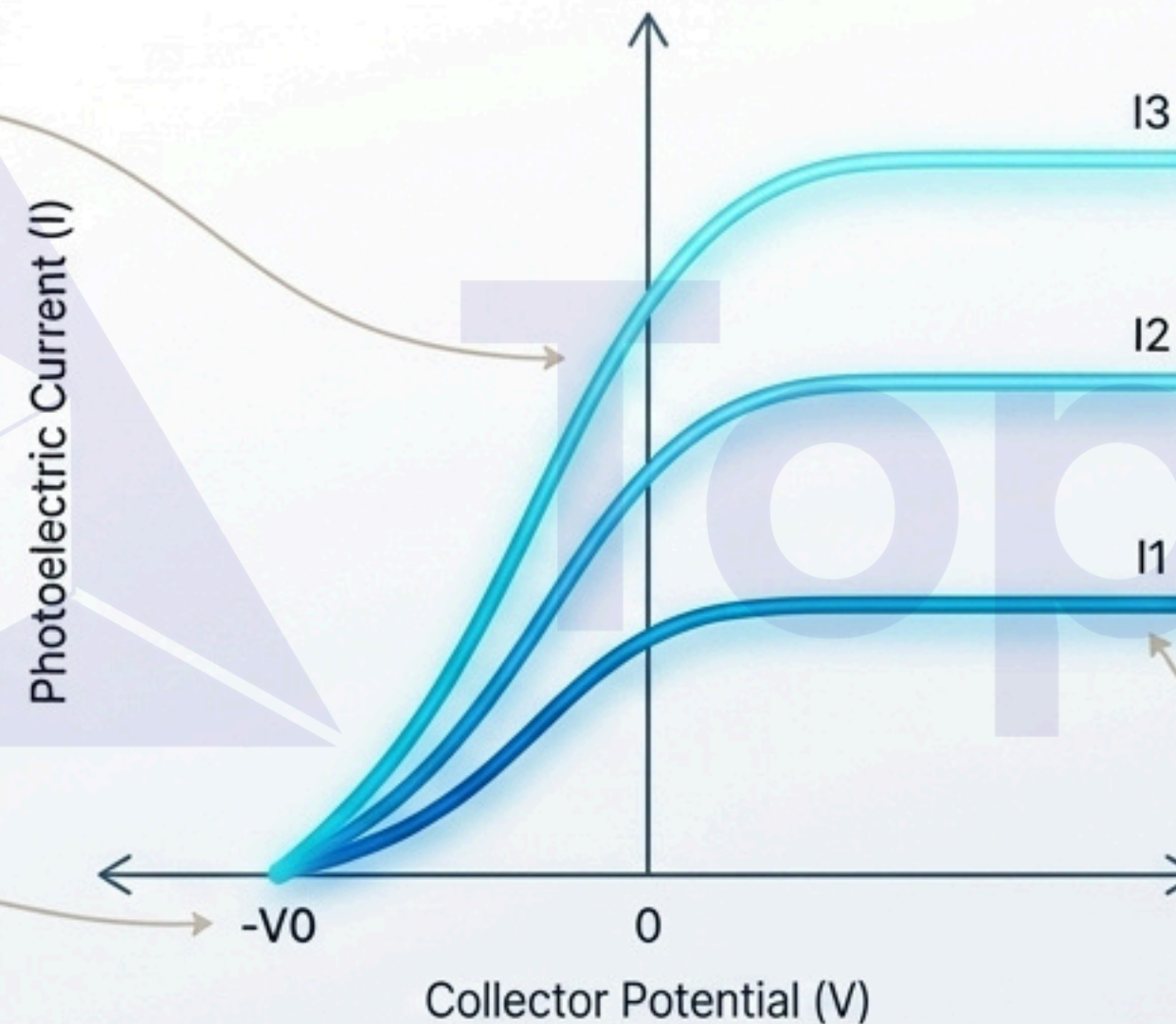
Saturation depends on intensity.

Higher intensity ($I_3 > I_2 > I_1$) means more emitted electrons per second, resulting in a higher saturation current.

V_0 measures Max Kinetic Energy.

The stopping potential serves as an exact, independent measure of the fastest emitted electron's energy.

The Data Model



Intensity does not change V_0 .

For a given light frequency, changing intensity does not change the maximum kinetic energy. All curves share the exact same cut-off point.



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