UNIVERSITÉ DE SHERBROOKE

PPMPMPPMPMPPMPPPMPPPMPPPMP05

Comment se déplace un signal?

Pascal-Emmanuel Lachance &
Maxime Grenier-Castillo

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Par: Pascal-Emmanuel Lachance &
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- Où l'impédance est la plus faible?
- Retour de courant
- Vitesse de déplacement d'un signal
- Tout est une ligne de transmission

Level 1: Surface Ripple [20min]

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  - EM Fields I [10min - Max]
  - Superposition I [1min - Max]
  - Charge Movement [4min - Max]
  - Harmonics I [3min - Max]
- Level 2: Current Paths [30min - 50min]

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- Level 1: Surface Ripple [20min]
- Level 2: Current Paths [30min - 50min]
  - Signal Source I [2min - Pascal]
  - Propagation Speed [5min - Pascal]
  - Ground planes [5min - Pascal]
  - Current loops [5min - Pascal]
  - Induction [5min - Pascal/Max]
  - Radiation I [3min - Max]
  - Fil d'une année lumière de long [5min - Pascal]
- Level 3: Impedance & Reflection [20min - 1h10]

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- Level 2: Current Paths [30min - 50min]
- Level 3: Impedance & Reflection [20min - 1h10]
  - Signal Source II [5min - Pascal]
  - Impédances [5min - Pascal]
  - Transmission Line [5min - Pascal]
  - Impedance Mismatch [5min - Pascal]
  - Réflection [5min - Pascal]
- Level 4: Noise [27min - 1h37]

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- Level 3: Impedance & Reflection [20min - 1h10]
- Level 4: Noise [27min - 1h37]
  - Decibel Review [5min - Max]
  - Signal Source III [5min - Max]
  - Noise Spectrum [2min - Max]
  - Harmonics II [3min - Max]
  - Signal to Noise Ratio (SNR) [5min - Max]
  - Jitter [5min - Pascal]
  - Eye diagram [5min - Pascal]
- Level 5: Crosstalk & Coupling [18min - 1h55]

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- Level 4: Noise [27min - 1h37]
- Level 5: Crosstalk & Coupling [18min - 1h55]
  - Radiation II [3min - Max]
  - Differential Pairs [5min - Pascal]
  - Far crosstalk [5min - Pascal]
  - Near crosstalk [5min - Pascal]
- Level 6: Basic Building Blocks [12min - 2h07]

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- Level 5: Crosstalk & Coupling [18min - 1h55]
- Level 6: Basic Building Blocks [12min - 2h07]
  - Signal Source IV [5min - Max]
  - Waveguide I [5min - Pascal]
  - Filters [2min - Max]
- Level 7: Field lines and Fringes [20min - 2h27]

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- Level 6: Basic Building Blocks [12min - 2h07]
- Level 7: Field lines and Fringes [20min - 2h27]
  - Waveguide III [5min - Pascal]
  - Skew, loss [5min - Pascal]
  - Skin effect [5min - Pascal]
  - EMI [5 min - Pascal]
- Level 8: Dielectric Depths [26min - 2h49]

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- Level 7: Field lines and Fringes [20min - 2h27]
- Level 8: Dielectric Depths [26min - 2h49]
  - Conduction [3min - Max]
  - Loss tangent [3min - Max/Pascal]
  - Frequency-dependant resistances [5 min - Pascal]
  - Current Bunching [3min - Max/Pascal]
  - Stackup [10min - Pascal]
  - Dispersion [2min - Max]
- Bonus Level 9: Advanced Building Blocks [17min - 3h06]

Fin de la 1er Partie

Fin officiel du PPMPMPPPMPMPPMPPPPMPPPPMPPPMP05. Le reste c'est pour les crinqué

Bonus Level 9: Advanced Building Blocks [17min - 3h06]

- Level 8: Dielectric Depths [26min - 2h49]
- Bonus Level 9: Advanced Building Blocks [17min - 3h06]
  - Signal Source V [2min - Max]
  - Waveguide II - [5min - Pascal]
  - Stubs [2min - Max]
  - Coupler [2min - Max]
  - Resonator [2min - Max]
  - Antennes [4min - Max]
- Bonus Level 10: Waveform Abyss [12min - 3h18]

Bonus Level 10: Waveform Abyss [12min - 3h18]

- Bonus Level 9: Advanced Building Blocks [17min - 3h06]
- Bonus Level 10: Waveform Abyss [12min - 3h18]
  - Modulation [3min - Max]
  - Mixing [2min - Max]
  - Superposition II [5min - Max]
- Bonus Level 11: S-Parameters and Smith Charts [17min - 3h35]

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- Bonus Level 10: Waveform Abyss [12min - 3h18]
- Bonus Level 11: S-Parameters and Smith Charts [17min - 3h35]
  - S parameters [5min - Pascal/Max]
  - Smith Charts [5min - Pascal/Max]
  - Impedance Matching Network [5min - Pascal]
  - Standing Waves [2min - Max]
- Bonus Level 12: Non-linearity Valley [14min - 3h49]

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- Bonus Level 11: S-Parameters and Smith Charts [17min - 3h35]
- Bonus Level 12: Non-linearity Valley [14min - 3h49]
  - Superposition III [3min - Max]
  - Distortion harmonique [5min - Max]
  - Intermodulation [3min - Max]
  - Crossmodulation [3min - Max]
- Bonus Level 13: Infrared Chasm [10min - 3h59]

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- Bonus Level 12: Non-linearity Valley [14min - 3h49]
- Bonus Level 13: Infrared Chasm [10min - 3h59]
  - When the equations fails [5min - Max]
  - Electron vibration frequency [2min - Max]
  - Blackbody Radiation [3min - Max]
- Final Boss: Integrated Photonics [18min - 4h17]

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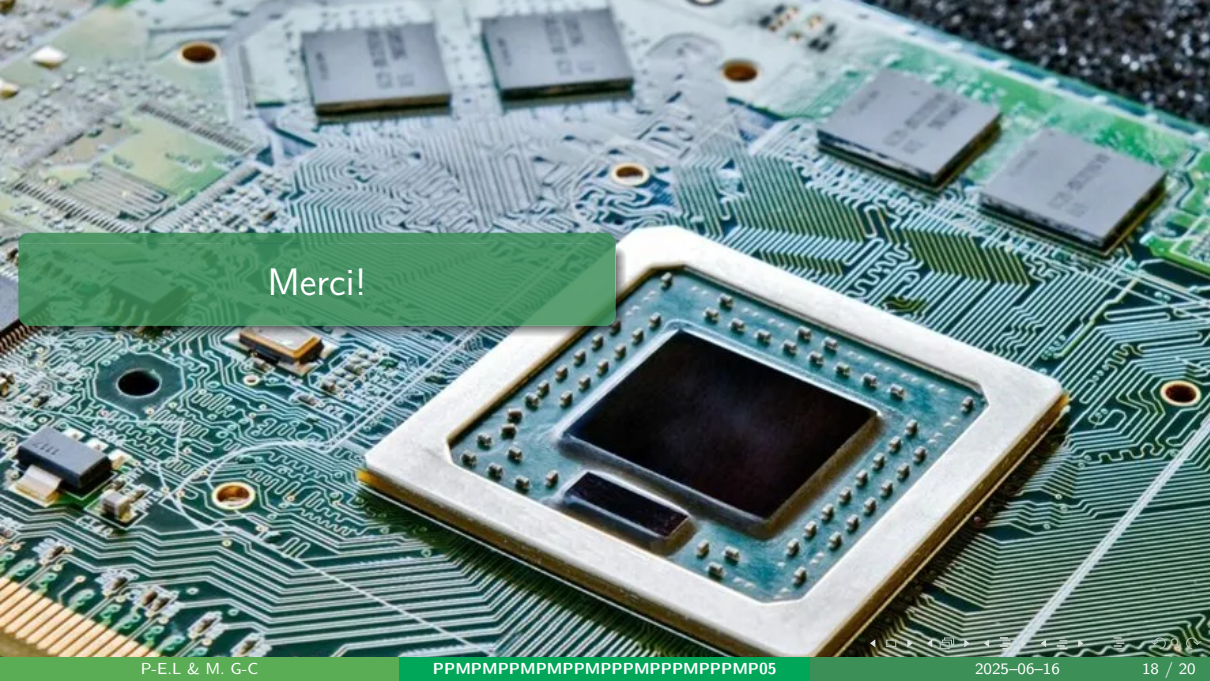
- Bonus Level 13: Infrared Chasm [10min - 3h59]
- Final Boss: Integrated Photonics [18min - 4h17]
  - RF Blocks can also be used to guide light [5min - Max]
  - We can make circuits with light [3min - Max]
  - We can manipulate light using Electrical Signals [5min - Max]
  - We can use photonics to generate and manipulate Microwave Signals [5min - Max]


Merci!

Prochain PPPPP

Bonnes pratiques de design

- Comment choisir ses composantes et optimiser son BOM?
- Comment bien conçevoir un symbole et un footprint?
- Bonnes pratiques de schémas
- Bonnes pratiques de layout
- Communication avec fabricants, assembleurs et programmeurs

Références