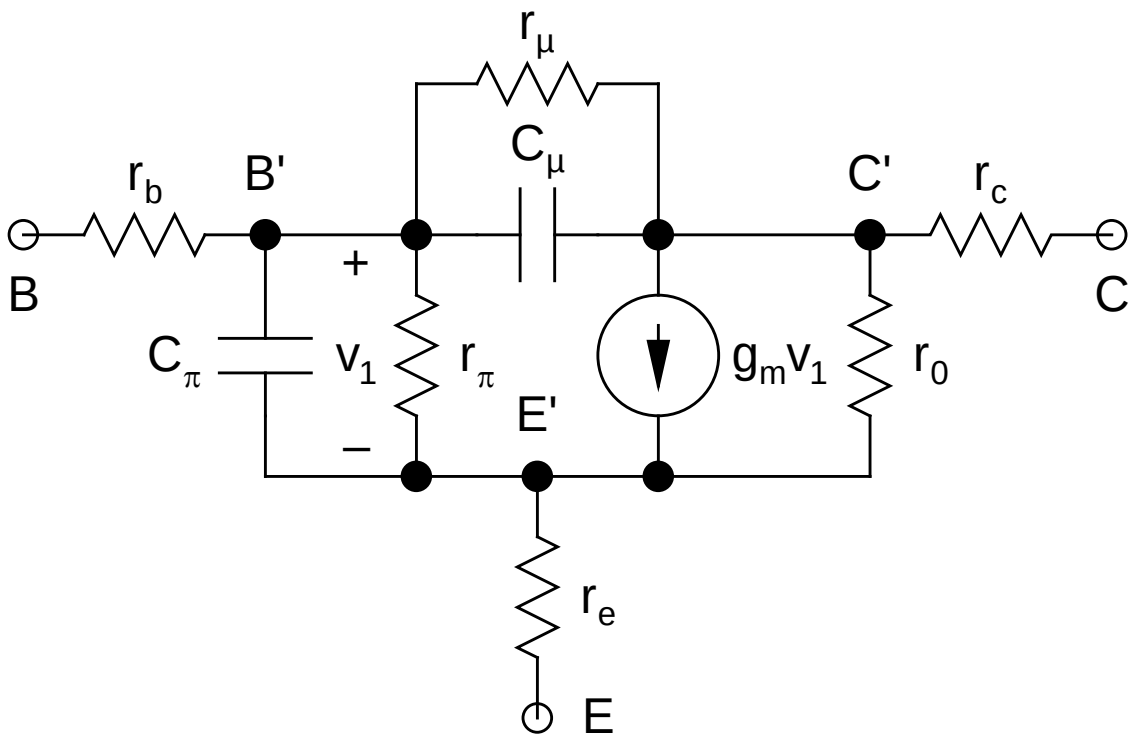
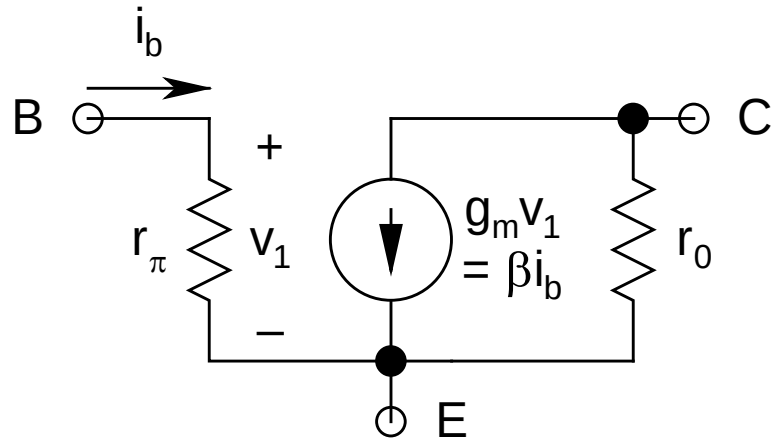
The Hybrid-π Model



E,B,C: Extrinsic Terminals

E',B',C': Intrinsic Terminals

- ***Simplifications***:
  - r_e, r_b, r_c can be ***safely neglected*** under ***low to moderate frequencies*** of operation
  - r_μ can be ***neglected***, since it's ***extremely large***
  - At ***low to moderate frequencies***, the ***capacitive reactances*** of C_π and C_μ will be ***extremely large*** $\Rightarrow$ can be ***neglected***
  - Leads to the ***Low-Frequency T-Model***, having only ***three components***: r_π, $g_m v_1$, and r_0
  - ***Simplest possible equivalent results if r_0 is also neglected***!



Low-Frequency T-Model

- **Note**: The ***output circuit*** resembles a ***non-ideal current source*** of ***magnitude*** $g_m v_1$ (or equivalently, βi_b) with ***output resistance*** r_0

- ***This model is appropriate when the ac input is applied to base***
- ***When the ac input is applied to the emitter, then need to draw this circuit in a slightly different way***