Analog Microwave Computer

Analog Computers

- Are physically realized models of a problem at hand.
- Have many unique features as compared to Von Neumann machines (see the Table).
- Possible realizations: op. amp., quantum, EM-wave-based, neuromorphic computers.
- Not intended to work alone but in synergy with a digital computer.

**PROS**
- Super-fast (no memory wall).
- Scalable (computation at multiple frequencies at once).
- Complex signals possible, multiple states.
- Non-integer non-binary logic.

**CONS**
- Complicated programming (if even possible).
- Hard to design.
- Hard to manufacture.
- Sensitive to environment/mechanical changes.

**Challenge**

- Synthetize a device performing summation and subtraction.
- Notice such a device at microwaves is rat-race coupler (see right).

**More...**

- CEM Group | cem.elmag.org
- Other topics: EM theory, fundamental bounds, synthesis