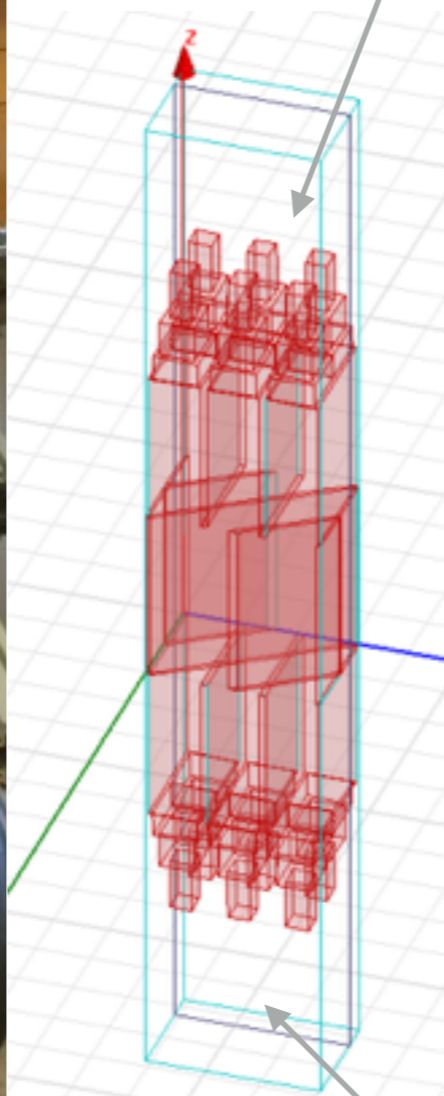


Metamaterial Silicon Half wave plates

90-150 broad
band geometry



Concept: cut anisotropic structures into silicon to engineer a birefringent metamaterial

Advantages:

- (1) larger birefringence than sapphire leads to thinner half wave plates with lower loss and emission
- (2) easy to AR coat

predicted performance:

- <1.5 K emission @ 300K
- > 95% modulation efficiency
- <2% reflections



single frequency
prototype