



I. Background and Objectives

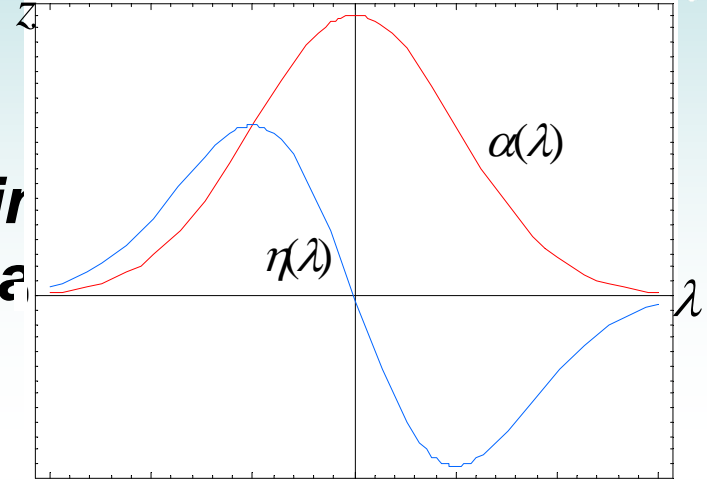


$$\eta(\lambda) \propto \frac{d}{\lambda^2} \alpha(\lambda)$$

Transmission Resonance in Left-Handed Metamaterials

$\eta(\lambda)$ = refractive index as a function of wavelength

$\alpha(\lambda)$ = absorption as a function of wavelength



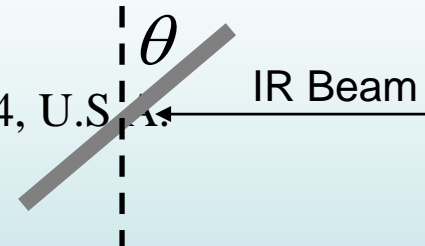
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Phillip X. Braun, and Claire Gmachl

1. To find a correlation between transmission resonance

(a) width and incident angle

(b) height and incident angle

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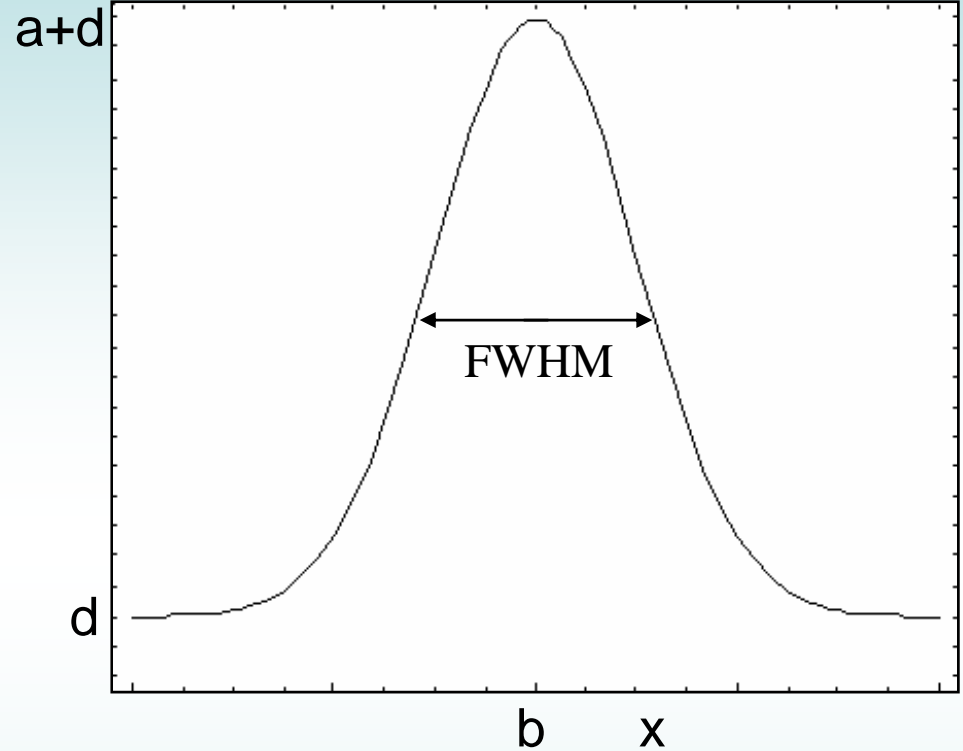
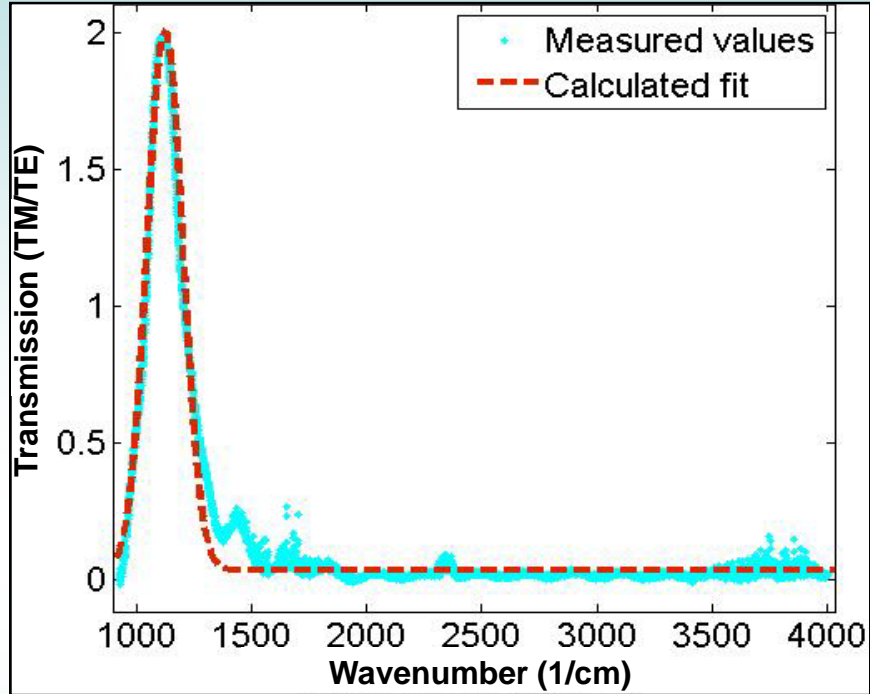
2. To develop a method of evaluating resonance broadening

supported in part by MIRTHE (NSF-ECC-0846144)

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II. Methods

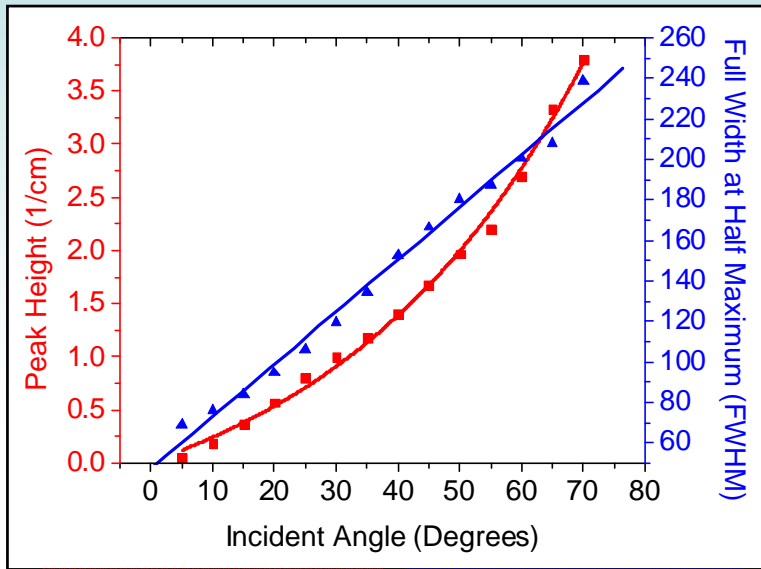


$$f(x) = ae^{-\left(\frac{(x-b)}{c}\right)^2} + d$$

Peak height = a

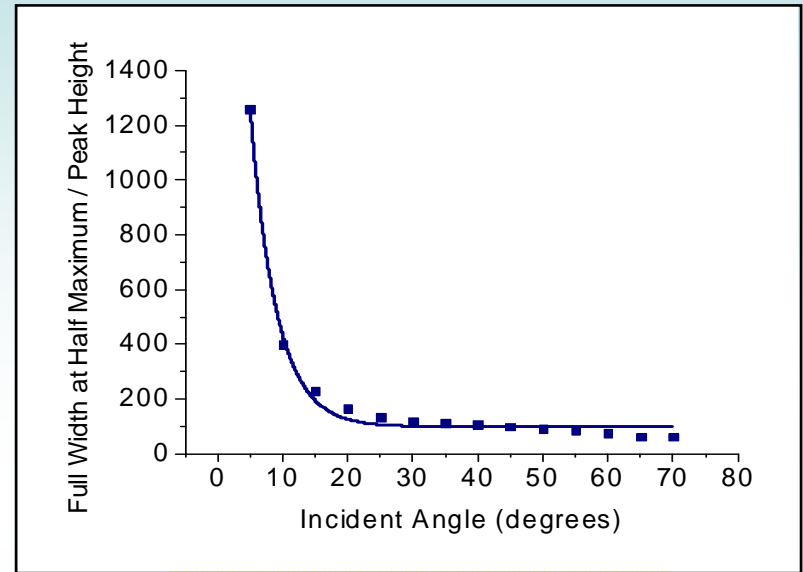
FWHM = $2c\sqrt{\ln(2)}$

III. Results and Conclusions



$$\hat{f}(x) = .83e^{\frac{x}{40.90}} - .81$$
$$r^2 = 0.99$$

$$\hat{f}(x) = 47.12 + 7.59x$$
$$r^2 = 0.99$$



$$\hat{f}(x) = 3990.49e^{-\frac{x}{19.98}} - 15.90$$
$$r^2 = 0.99$$

- The proposed reference for evaluating new LHMs is the FWHM / Peak Height ratio
- A high ratio is ideal for weakening refractive index fluctuations