Research Data Supporting "Metasurfaces atop Metamaterials: Surface Morphology Induces Linear Dichroism in Gyroid Optical Metamaterials"

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The data is arranged into nine folders (.zip; **bold**), each of which contains the following files (.jpg, .tif, .txt, and .csv files; *italics*). This data and the descriptions below should be read in conjunction with the manuscript.

1. **Scanning Electron Microscopy**
   Figure1a.tif; electron micrograph of a gold gyroid metamaterial; sample "V36", 5 kV acceleration voltage; 2.6 mm working distance.

2. **Optical Microscopy**
   Figure1b.jpg; optical micrograph of gold gyroid optical metamaterial under linearly polarized light; sample "V36", linearly polarized light, reflection, 20x magnification.

3. **Reflection Goniometer Measurements**
   - *ExperimentReflectionAngles.txt;* angles (azimuthal) in ° at which reflection goniometer measurements are taken; single column.
   - *ExperimentReflectionWavelengths.txt;* wavelengths in nm at which reflection goniometer measurements are taken; single column.
   - *ExperimentReflectionSpectraGyroid.csv;* normalized goniometer reflectance spectra; rows correspond to those wavelengths in *Wavelengths.txt*, columns to those angles in *Angles.txt*.

4. **Transmission Goniometer Measurements**
   - *ExperimentTransmissionAngles.txt;* angles (azimuthal) in ° at which reflection goniometer measurements are taken; single column.
   - *ExperimentTransmissionWavelengths.txt;* wavelengths in nm at which reflection goniometer measurements are taken; single column.
   - *ExperimentTransmissionSpectraGyroid.csv;* normalized goniometer reflectance spectra; rows correspond to those wavelengths in *Wavelengths.txt*, columns to those angles in *Angles.txt*.

5. **Simulated Reflectance Spectra**
   Reflections_tXX_phi_sweep.txt; simulated reflectance spectra at a termination *XX* (e.g. *XX = 0.32*, where τ = 0.32); wavelength in nm (first column), azimuthal angle in ° (second column; 0, 45, 90, and 135°), reflectance (third column); 26 files in total.

6. **Simulated Transmittance Spectra**
   Transmissions_t0.XX_phi_sweep.txt; simulated reflectance spectra at a termination *XX* (e.g. *XX = 0.32*, where τ = 0.32); wavelength in nm (first column), azimuthal

angle in ° (second column; 0, 45, 90, and 135°), reflectance (third column); 25 files in total.

7. Analytical Maxwell-Garnett Reflectance Spectra

MG_reflections_t24_r3.2_d0.12_phiXX.txt; analytical reflectance spectra from the Maxwell-Garnett anisotropic effective medium layer atop the isotropic bulk effective medium gyroid at azimuthal angles of *XX* (e.g. *XX = 45*, φ = 45°). Wavelength in nm (first column), reflectance parallel to the incident polarization (second column), reflectance perpendicular to the incident polarization (third column); the total reflectance is the sum of the reflectance parallel and perpendicular to the incident polarization; 4 files in total.

8. Permittivities

epsilons_r0.32.txt; permittivities of the anisotropic Maxwell-Garnett effective medium layer and the isotropic bulk effective medium gyroid; wavelength in nm (first column), real part of the permittivity of the Maxwell-Garnett layer at an orientation of 55° (second column), imaginary part of the permittivity of the Maxwell-Garnett layer at an orientation of 55° (third column), real part of the permittivity of the Maxwell-Garnett layer at an orientation of 145° (fourth column), imaginary part at an orientation of 145° (fifth column), real part of the permittivity of the bulk gyroid (sixth column), imaginary part of the permittivity of the bulk gyroid (seventh column).

9. Gyroid Surface Reflectance Spectra

- *g016-XX-pol-wl.txt;* wavelengths in µm at which the τ = 0.16 gyroid surface reflectance spectra are simulated for either an original arrangement of the surface protrusion (*XX = orig*) or a shifted arrangement (*XX = moved2a*); single column; 2 files.
- *g016-XX-pol-spec.txt;* simulated reflectance spectra for the τ = 0.16 gyroid surface for either an original arrangement of the surface protrusion (*XX = orig*) or a shifted arrangement (*XX = moved2a*); rows correspond to those wavelengths in *g016-XX-pol-wl.txt*; polarization azimuthal angle 0° (first column), 45° (second column), 90° (third column), and 135° (fourth column); 2 files in total.
- *g016-XX-efield-YYnm-ZZdeg.txt;* simulated electric field distribution for the τ = 0.16 gyroid surface for either an original arrangement of the surface protrusion (*XX = orig*) or a shifted arrangement (*XX = moved2a*); for 605 (*YY = 605*) or 665 nm (*YY = 665*); and 45 (*ZZ = 45*) or 135° (*ZZ = 135*) polarization azimuthal angle; 4 files in total.
- *g024-XX-pol-wl.txt;* wavelengths in µm at which the τ = 0.24 gyroid surface reflectance spectra are simulated for either an original arrangement of the surface protrusion (*XX = Rot0*) or a rotated arrangement (*XX = Rot45*); single column; 2 files.
- *g024-XX-pol-spec.txt;* simulated reflectance spectra for the τ = 0.16 gyroid surface for either an original arrangement of the surface protrusion (*XX = Rot0*) or a rotated arrangement (*XX = Rot45*); rows correspond to those wavelengths in *g016-XX-pol-wl.txt*; polarization azimuthal angle 0° (first column), 45° (second column), 90° (third column), and 135° (fourth column); 2 files in total.
- *g024-XX-efield-YYnm-ZZdeg.txt:* simulated electric field distribution for the τ = 0.24 gyroid surface for either an original arrangement of the surface protrusion (*XX = Rot0*) or a rotated arrangement (*XX = Rot45*); for 630 (*YY = 630*) or 665 nm (*YY = 665*); and 45 (*ZZ = 45*) or 135° (*ZZ = 135*) [*Rot0*] or 0 (*ZZ = 0*) or 90° (*ZZ = 90*) [*Rot45*] polarization azimuthal angles; 4 files in total.