1. File 'Raw Data for Figure 4 QPM-Peak'

Column G-K describe the Wavelength Vs TM mode Output of the wavelength scan using lock-in amplifier on 900nm wide waveguides set with different lengths of SiN segment and garnet segment, where there is an obvious peak in the trace(see more measurement setup info in the paper). Column A-B is the same as Column G-H. Column G is the wavelength, from 1500 to 1630nm. Column H is the output of the waveguide with 10.5μm long garnet segment and 6μm long SiN segment. Column I is the output of the waveguide with 10μm long garnet segment and 6μm long SiN segment. Column J is the output of the waveguide with 9.5μm long garnet segment and 6μm long SiN segment. Column I is the output of the waveguide with 9μm long garnet segment and 6μm long SiN segment. Column N-R describe the Wavelength Vs TM mode Output of the wavelength scan on 800nm wide waveguides set. Column N is the wavelength, from 1500 to 1630nm. Column O is the output of the waveguide with 10.5μm long garnet segment and 7μm long SiN segment. Column P is the output of the waveguide with 10μm long garnet segment and 7μm long SiN segment. Column Q is the output of the waveguide with 9.5μm long garnet segment and 7μm long SiN segment. Column R is the output of the waveguide with 9μm long garnet segment and 7μm long SiN segment.

V2 is the width of the waveguide set, 900nm. U8 is the Faraday rotation degree of YIG garnet. U9 is the Faraday rotation degree of CeYIG garnet. V10 is the actual width of the waveguide on the fabricated device when designed as 900nm. W3-6 is the peak wavelength corresponding to the 900nm width scan traces showed in Column G-K. X3-6 is the corresponding total length (length of garnet segment+ length of SiN segment) of the device in experiment. Y3-6 is the corresponding total length of the device in simulation, which is the same as AB8-11. W8-AB11 shows the simulation results using Matlab. W8-11 is the peak wavelengths. X8-11 and Y8-11 are the delta dielectric constant of the two garnet materials on the device. Z8-11 is the simulated result of the garnet segment length. AA8-11 is the simulated result of the SiN segment length. AB8-11 is the simulated result of the total length (length of garnet segment+ length of SiN segment).

V17 is the width of the waveguide set, 800nm. V23 is the actual width of the waveguide on the fabricated device, when designed as 800nm. W18-21 is the peak wavelength corresponding to the 800nm width scan traces showed in Column N-R. X18-21 is the corresponding total length (length of garnet segment+ length of SiN segment) of the device in experiment. Y18-21 is the corresponding total length of the device in simulation, which is the same as AB23-26. W23-AB26 shows the simulation results using Matlab. W23-26 is the peak wavelengths. X23-26 and Y23-26 are the delta dielectric constant of the two garnet materials on the device. Z23-26 is the simulated result of the garnet segment length. AA23-26 is the simulated result of the SiN segment length. AB23-26 is the simulated result of the total length (length of garnet segment+ length of SiN segment).

2. File 'Raw Data for Figure 5 CUI0314e-0.9um2-1-1-0.01sn'

This file presents data of the output mode after passing through the integrated Faraday rotator, with pure TE mode injected in (see more measurement info in paper). Samples was magnetically saturated **against** the light propagation direction. Column A is the time stamps. Column B is the wavelength corresponding to each time stamp, at a resolution of 0.01nm over 5nm range. Column C-E describes the Stokes 1-3 parameters of the output mode. Column F is the Azimuth of the output mode. Column G is the Ellipticity of the output mode. Column H is

the power split ratio between TE and TM mode. Column I is the phase difference. Column J is the degree of power. Column K is the power in dB. Column L is the power in W.

3. File 'Raw Data for Figure 5 CUI0314e-0.9um2-1-1-0.01sp'

This file presents data of the output mode after passing through the integrated Faraday rotator, with pure TE mode injected in (see more measurement info in paper). Samples was magnetically saturated **along** the light propagation direction. Column A is the time stamps. Column B is the wavelength corresponding to each time stamp, at a resolution of 0.01nm over 5nm range. Column C-E describes the Stokes 1-3 parameters of the output mode. Column F is the Azimuth of the output mode. Column G is the Ellipticity of the output mode. Column H is the power split ratio between TE and TM mode. Column I is the phase difference. Column J is the degree of power. Column K is the power in dB. Column L is the power in W.

4. File 'Raw Data for Figure 6 CUI0224-90086-0.001sn'

This file presents data of the output mode after passing through the integrated Faraday rotator, with pure TE mode injected in (see more measurement info in paper). Samples was magnetically saturated **against** the light propagation direction. Column A is the time stamps. Column B is the wavelength corresponding to each time stamp, at a resolution of 0.001nm over 1nm range. Column C-E describes the Stokes 1-3 parameters of the output mode. Column F is the Azimuth of the output mode. Column G is the Ellipticity of the output mode. Column H is the power split ratio between TE and TM mode. Column I is the phase difference. Column J is the degree of power. Column K is the power in dB. Column L is the power in W.

5. File 'Raw Data for Figure 6 CUI0224-90086-0.001sp'

This file presents data of the output mode after passing through the integrated Faraday rotator, with pure TE mode injected in (see more measurement info in paper). Samples was magnetically saturated **against** the light propagation direction. Column A is the time stamps. Column B is the wavelength corresponding to each time stamp, at a resolution of 0.001nm over 1nm range. Column C-E describes the Stokes 1-3 parameters of the output mode. Column F is the Azimuth of the output mode. Column G is the Ellipticity of the output mode. Column H is the power split ratio between TE and TM mode. Column I is the phase difference. Column J is the degree of power. Column K is the power in dB. Column L is the power in W.