**Introduction**

- Surface plasmon polaritons (SPPs) – hybrid electron-photon surface waves [1]
- Pancharatnam-Berry (PB) phase – cyclic polarization-state changes [2]
- PB phase – half the solid angle subtended by a path on the Poincaré sphere [3], e.g., path ABCDEA
- PB phase is topological in nature (different from usual dynamical phase)

**Experiment**

- Mach-Zehnder interferometer
- Light → SPP → light conversion by a grating-slit combination
- Rotation of a linear polarizer and a quarter-wave plate to change the solid angle; e.g., C to D and D to E on the sphere
- Dynamical phase remains constant

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**Results**

- Pancharatnam-Berry phase – shift of interference fringes

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**Conclusions**

- Experimentally, PB phase is observed as a shift in fringes
- Light → SPP → light conversion process follows Pancharatnam’s rule
- Findings are fundamental and important for photonic applications

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