ToPP! Topology of Pulsar Profiles Comparing profile's Stokes I morphology w = 0 if identical ¹Anton Pannekoek Institute for Astronomy, University of Amsterdam, NL; ²ASTRON, Netherlands Institute for Radio Astronomy, NL; article *email: d.vohl@uva.nl <u>with</u> J. van Leeuwen A pulsar average profile (intensity vs rotational phase) & Y. Maan is its signature essential tool for pulsar timing (A&A, 2024)w > 0 if different Average profiles are (mostly) time-stable carrying info about emission regions and geometry How do 90 pulsars relate? We use graph theory to investigate 400-700 MHz 700-1000 MHz 1000-1500 MHz 1500-2000 MHz the European Pulsar Network database. J0528+2200 (D) J2048-1616 (T) * J1136+1551 (D) * J2354+6155 (-) J1823-3106 (-) Sequencing * J1543-0620 (Sd?) highlights J2219+4754 (St). morphology J0614+2229 (St) evolution Minimum Spanning Tree on w * J2022+5154 (Sd/T?) . across (organizes pulsars by spectro-temporal morphology) * J2257+5909 (St). pulsars J2326+6113 (T) ₋ * J0630-2834 (Sd) J0953+0755 (Sd?) 10 radio beam rotation axis 9 outer acceleration frequency (a) inner acceleration Frequency thought to open field lines 8 closed field lines light cylinder relate to //altitude in magnetosphere J0534+2200 B0531+21 Oswald et al. (2020) Lorimer & Kramer (2005) 6 J1832-0827 81829-08 - 10⁰ J1847-0402 B1844-04 J1239+2453 B1237+25 J1833-0338 81831-03 (P, \dot{E}, B) Binary We can relate graph regions to physical parameters Radio to infrared emission Supernova remnant RGB color mapping (Period (P), X-ray source Spin-down energy (\dot{E}) , γ -ray source 10 Magnetic field strength (B)) 10^{-15} down 10^{-1} Spin 10^{-19} **O** • • 10^{-2} 10^{-3} 10^{-1} 10^{0} P (s)

Spin period