## Instrumental polarization with EMIR. Measured on July 3<sup>rd</sup> 2020

S.Navarro, July 29<sup>th</sup> 2020

The instrumental polarization, both circular and linear, has been recently measured on the lower three frequency EMIR bands (E090, E150 and E230). The result confirms the variability of the circular polarization with frequency and/or band and the lower absolute value of the circular polarization in the E230 band.

Several slots of technical time (TT) have been used for measuring the instrumental circular polarization of the EMIR instrument. From all of them, only the last one, on July the 3<sup>rd</sup> 2020, was performed under good weather conditions. Tau at zenith was 0.15 at 230 GHz and the elevation of the source (Uranus) was always higher than 49 degrees. The rest of the TT blocks were either used for other urgent technical activities or mostly lost due to unusable weather conditions.

The following plot summarizes the measurements taken during July 3<sup>rd</sup>. Every frequency point, except the last one at 263 GHz, was observed twice. Every result is plotted so it is easy to see the reproducibility of the data.



The linear polarization shows some variability with frequency but no clear difference between bands. Taking all the points, the average instrumental linear polarization is 1.2%. For the circular polarization we see variability with frequency and band. The sign of the polarization is negative for the E090 and E230 bands while it is positive for the E150 band. Maybe related to the sign of the lateral offset of the beam from the telescope axis. Something that could be easily confirmed by observing with the E150 band on the left beam (using the E090+E150 combination).