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Near Infrared Imaging Polarimetry of Mon R2 IRS

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H and K' band imaging polarimetry has been made by OASIS for the star forming region Mon R2 IRS. Large polarization over the whole nebula is characterized by dust scattering of the NIR radiation from multiple illuminators, IRS 2, IRS 3, IRS 1 and IRS 6. IRS 2 is predominantly illuminating both the IR ring and the extended nebula at K'. Note that the aligned pattern seen between IRS 2 and IRS 3 is not due to dichroic absorption, but results from combination of scattered light from both IRS 2 and IRS 3.

The data also show other new information. 1) the nebula associated with IRS 3 apparently shows bipolar nature and its extended direction is parallel to the axis of the 'polarization disk' indicated by our polarimetry. 2) the IRS 3 nebula must be located at the back of the IRS 2 nebula with non-uniform high extinction between them. The line-of-sight distance between IRS 3 and the IR ring is estimated to be less than 0.23 pc. 3) An arc structure of the enhanced polarized flux is observed from the IR ring open to the NW direction, which is interpreted as reflection of the cavity wall of blue shift outflow. This is the first evidence that IRS 2 is the driving source of existing molecular outflows. 4) The magnetic field in Mon R2 IRS shows a pinched-in structure, as traced by our aperture polarimetry for background/embedded stars around/in the core region. There is continuity of the field direction in the core region to that on a large scale inferred from the optical polarimetry, but there is no evidence showing the bending field in the core as inferred from the submillimeter polarimetry.