Longitudinal and spin/valley Hall optical conductivity in single layer MoS$_2$ ZHOU LI, JULES CARBOTTE, McMaster University — A monolayer of MoS$_2$ has a non-centrosymmetric crystal structure, with spin polarized bands. It is a two valley semiconductor with direct gap falling in the visible range of the electromagnetic spectrum. Its optical properties are of particular interest in relation to valleytronic and possible device applications. Circular polarized light associated with each of the two valleys separately is considered and results are filtered according to spin polarization. Temperature can greatly change the spin mixture seen in the frequency window where they are not closely in balance.