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Imaging Polarimetry of Cometary Dust: Different Comets and Cometary Regions

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Polarimetric observations of the light scattered by dust in cometary comae have been carried out since 1990. Maps of polarization have been obtained which allow to observe different regions in a cometary coma, pointing to different physical properties of the dust. Such differences as well as an observed wavelength effect, tend to show that large aggregates made of submicron grains could be present in certain comets or cometary comae regions. On the opposite more compact particles seem to be present in other comets. To interpret such differences in terms of these particles physical properties, numerous levitating samples (compact and fluffy) are studied by the PROGRA2 experiment, either in microgravity conditions (parabolic flights), or lifted by an air draught (ground based conditions). Some past and recent observations (comets C/2000 WM1, C/1999 S4, C/2004 Q2 Machholz and if available comet 73P) will be presented and discussed in terms of the physical properties of the particles by comparison to other observational techniques and laboratory measurements on levitating particles.