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Challenges and advantages of the ground based magnetometer dataset in monitoring of the near Earth space environment.

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Historically ground based magnetometers data have been the workhorse of magnetosphere-ionosphere (M-I) community. They continue to play an essential role in the monitoring of the near Earth space environment but the full utilization of the many stations has only recently become a routine operation with the introduction of SuperMAG. SuperMAG has further allowed the introduction of new indices based on >100 stations in contrast to the official IAGA indices which are often derived from less than 10 stations. We discuss the advantages and disadvantages of these new indices in comparison with the official indices. In this talk we illustrate the strength of this dataset, we explain the processing provided by SuperMAG, show how spatial gaps in the coverage can be overcome and finally discuss the complexities associated with the interpretation of the measurements. We illustrate this logical progression of the data utilization with the recent comprehensive study by Laundal et al. showing the importance of the solar induced ionospheric conductance for the large-scale M-I current system.