

PH37540: Project - Literature Research Strategy

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Research Strategy

This document briefly details the literature research strategy for the project entitled, “Solar Wind Conditions Driving Geomagnetic Activity” undertaken by the authors. The strategy was as follows. Firstly, broad background reading on the subject of geomagnetic activity and solar wind was completed to determine keywords on the topic to search in the Web of Knowledge database. Whilst the searching process was underway, further keywords obtained from abstracts were entered included in the search process. Particular searches fulfilled during this process are shown in the table below. Some literature has been selected from the acquired collection during the search process has been included in this document, characterised by certain keywords.

Tabular Representation of Searches

No.	Query	Results	Evaluation
1	“Geomagnetic+Activity”	3,587	Far too broad
2	“Solar+Wind” AND “Geomagnetic+Activity”	990	Still too broad
3	“Solar+Wind” AND “Conditions” AND “Driving” AND “Geomagnetic+Activity”	44	Acceptable
4	“Advanced+Composition+Explorer” OR “ACE+Spacecraft”	735	Still quite broad
5	“Advanced+Composition+Explorer” OR “ACE+Spacecraft” AND “Solar+Wind”	679	Change ‘OR’ to ‘AND’
6	“Advanced+Composition+Explorer” AND “ACE+Spacecraft” AND “Solar+Wind”	206	Acceptable
7	“Geomagnetic+Indices”	521	Rather broad
8	“Solar+Wind” AND “Geomagnetic+Indices”	214	Can still be more specific
9	“Solar+Wind” AND “Geomagnetic+Indices” AND “Solar+Cycle”	53	Acceptable
10	“Earth*+Magnetosphere”	915	Requires more precision
11	“Earth*+Magnetosphere” AND “Solar+Wind”	338	Still quite broad
12	“Earth*+Magnetosphere” AND “Solar+Wind” AND “Coupling”	54	Acceptable
13	“Coronal+Mass+Ejection*” AND “Solar+Wind”	1,963	Still broad
14	“Coronal+Mass+Ejection*” AND “Solar+Wind” AND “Geoeffectiveness”	109	Acceptable
15	“Coronal+Hole*” AND “Co-rotating+Interaction+Region*”	12	Too specific, use acronym “CIR”
16	“Coronal+Hole*” AND “CIR*”	258	Too extensive
17	“Coronal+Hole*” AND “CIR*” AND “Solar+Wind”	197	Still quite broad, swap out keyword
18	“CIR*” AND “Solar+Wind” AND “Geoeffectiveness”	28	Acceptable
19	“Magnetometer*” AND “Ground+Based”	488	Still quite extensive
20	“Magnetometer*” AND “Ground+Based” AND “Solar+Wind”	149	Acceptable
21	“DST+Index”	9,675	Too broad
22	“DST” AND “Geomagnetic+Index”	123	Acceptable
23	“K+Index”	632	Quite broad
24	“K” AND “Geomagnetic+Index”	56	Acceptable
25	“Geomagnetic+Storm*” AND “Solar+Wind”	1,112	Still quite broad
26	“Geomagnetic+Storm*” AND “Solar+Wind” AND “DST+Index”	116	Acceptable
27	“Solar+Magnetic+Cycle” AND “22+Year”	43	Acceptable

Additional Keywords from Abstracts

Solar Particle Event (SPE), Interplanetary Magnetic Field (IMF), Ring current, substorms, semi-annual variation, polarity, high-speed streams, geomagnetic cavity, plasma sheet, bow shock, ionosphere.

Selected Preliminary Literature

Solar Magnetic Cycle

BENEVOLENSKAYA, E. E. 1994. THE STRUCTURE OF THE SOLAR MAGNETIC CYCLE. *Astronomy Letters-a Journal of Astronomy and Space Astrophysics*, 20, 468-471.

CLIVER, E. W., BORIAKOFF, V. & BOUNAR, K. H. 1996. The 22-year cycle of geomagnetic and solar wind activity. *Journal of Geophysical Research-Space Physics*, 101, 27091-27109.

Solar Wind

MURSULA, K., HILTULA, T. & ZIEGER, B. 2003. A systematic 22-year pattern in solar wind. In: VELLI, M., BRUNO, R. & MALARA, F. (eds.) *Solar Wind Ten, Proceedings*.

VERBANAC, G., VRSNAK, B., ZIVKOVIC, S., HOJSAK, T., VERONIG, A. M. & TEMMER, M. 2011. Solar wind high-speed streams and related geomagnetic activity in the declining phase of solar cycle 23. *Astronomy & Astrophysics*, 533.

Geomagnetic Activity and Storms

GONZALEZ, W. D., JOSELYN, J. A., KAMIDE, Y., KROEHL, H. W., ROSTOKER, G., TSURUTANI, B. T. & VASYLIUNAS, V. M. 1994. WHAT IS A GEOMAGNETIC STORM. *Journal of Geophysical Research-Space Physics*, 99, 5771-5792.

SAIZ, E., CERRATO, Y., CID, C., DOBRICA, V., HEJDA, P., NENOVSKI, P., STAUNING, P., BOCHNICEK, J., DANOV, D., DEMETRESCU, C., GONZALEZ, W. D., MARIS, G., TEODOSIEV, D. & VALACH, F. 2013. Geomagnetic response to solar and interplanetary disturbances. *Journal of Space Weather and Space Climate*, 3, 20.

ACE Spacecraft and Ground-Based Magnetometers

CHIU, M. C., VON-MEHLEM, U. I., WILLEY, C. E., BETENBAUGH, T. M., MAYNARD, J. J., KREIN, J. A., CONDE, R. F., GRAY, W. T., HUNT, J. W., MOSHER, L. E., MCCULLOUGH, M. G., PANNETON, P. E., STAIGER, J. P. & RODBERG, E. H. 1998. ACE spacecraft. *Space Science Reviews*, 86, 257-284.

OPREA, C., MIERLA, M., BESLIU-IONESCU, D., STERE, O. & MUNTEAN, G. M. 2013. A study of solar and interplanetary parameters of CMEs causing major geomagnetic storms during SC 23. *Annales Geophysicae*, 31, 1285-1295.

TURNBULL, K. L., WILD, J. A., HONARY, F., THOMSON, A. W. P. & MCKAY, A. J. 2009. Characteristics of variations in the ground magnetic field during substorms at mid latitudes. *Annales Geophysicae*, 27, 3421-3428.

Geomagnetic Indices: DST- and K-index

BANERJEE, A., BEJ, A. & CHATTERJEE, T. N. 2012. On the existence of a long range correlation in the Geomagnetic Disturbance storm time (Dst) index. *Astrophysics and Space Science*, 337, 23-32.

PAPITASHVILI, N. E., PAPITASHVILI, V. O., BELOV, B. A., HAKKINEN, L. & SUCKSDORFF, C. 1992. MAGNETOSPHERIC CONTRIBUTION TO K-INDEXES. *Geophysical Journal International*, 111, 348-356.

Solar Processes: CMEs, Coronal Holes and CIRs

VERBANAC, G., ZIVKOVIC, S., VRSNAK, B., BANDIC, M. & HOJSAK, T. 2013. Comparison of geoeffectiveness of coronal mass ejections and corotating interaction regions. *Astronomy & Astrophysics*, 558.

GOPALSWAMY, N. 2008. Solar connections of geoeffective magnetic structures. *Journal of Atmospheric and Solar-Terrestrial Physics*, 70, 2078-2100.