

# Literature Search Strategy

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Several data bases were consulted in this preliminary literature search, in preparation for conducting a full literature review on the topic of Sunspot Tracking. The data bases used are 'Web of Knowledge' (Specifically, the Web of Science Primo data base), 'Astrophysics Data Systems' (ADS) and 'NASA Technical Report Server' (NTRS).

Key words specific to sunspots and sunspot tracking and rotation were entered into the stated data bases, with background searches also conducted on the causes of sunspots and the effect of solar cycles.

As there is a lot of information surrounding this topic, very refined searches were needed to narrow down the relevant information.

## Web of Knowledge results;

No.	Query	Hits	Evaluation
1	"Sunspot"	8,913	Too broad - must refine
2	"Sunspot motion"	8	Good result, included sunspot motion statistics
3	"Sunspot motion" AND "Tracking"	60	Useful texts
4	"Sunspot motion" AND "Differential Rotation"	114	Use key words to narrow search
5	"Sunspot motion" AND "Differential Rotation" AND "Tracking"	5	Very relevant articles
6	"Sunspot" AND "Shape"	284	Use key words to narrow search
7	"Sunspot" AND "Shape" AND "Tracking"	12	Relevant texts
8	"Solar Maximum"	1,968	Too broad - must refine with keywords
9	"Solar Maximum" AND "Sunspots"	53	Useful texts
10	"Solar Cycle"	7,311	Too broad, included too much on climate change
11	"Solar Cycle" AND "Sunspots"	1,629	Still too broad a result, but now limited to sunspots
12	"Solar Cycle" AND "Sunspot Motion"	2	Acceptable set
13	"Magnetic flux tubes"	1,551	Too broad, will add the sunspot filter
14	"Magnetic flux tubes" AND "Sunspots"	342	Better, acceptable set
15	"Spörer's Law"	4	Acceptable set
16	"Convection Zone"	2,440	Too broad, will introduce solar convection zone
17	"Solar convection zone"	772	Will add the sunspot filter to narrow search
18	"Solar convection zone" AND "Sunspots"	142	Acceptable set
19	"Coronal Loops"	1,800	Will add the sunspot filter to narrow search
20	"Coronal Loops" AND "Sunspots"	142	Acceptable set

## Astrophysics Data Systems (ADS) results;

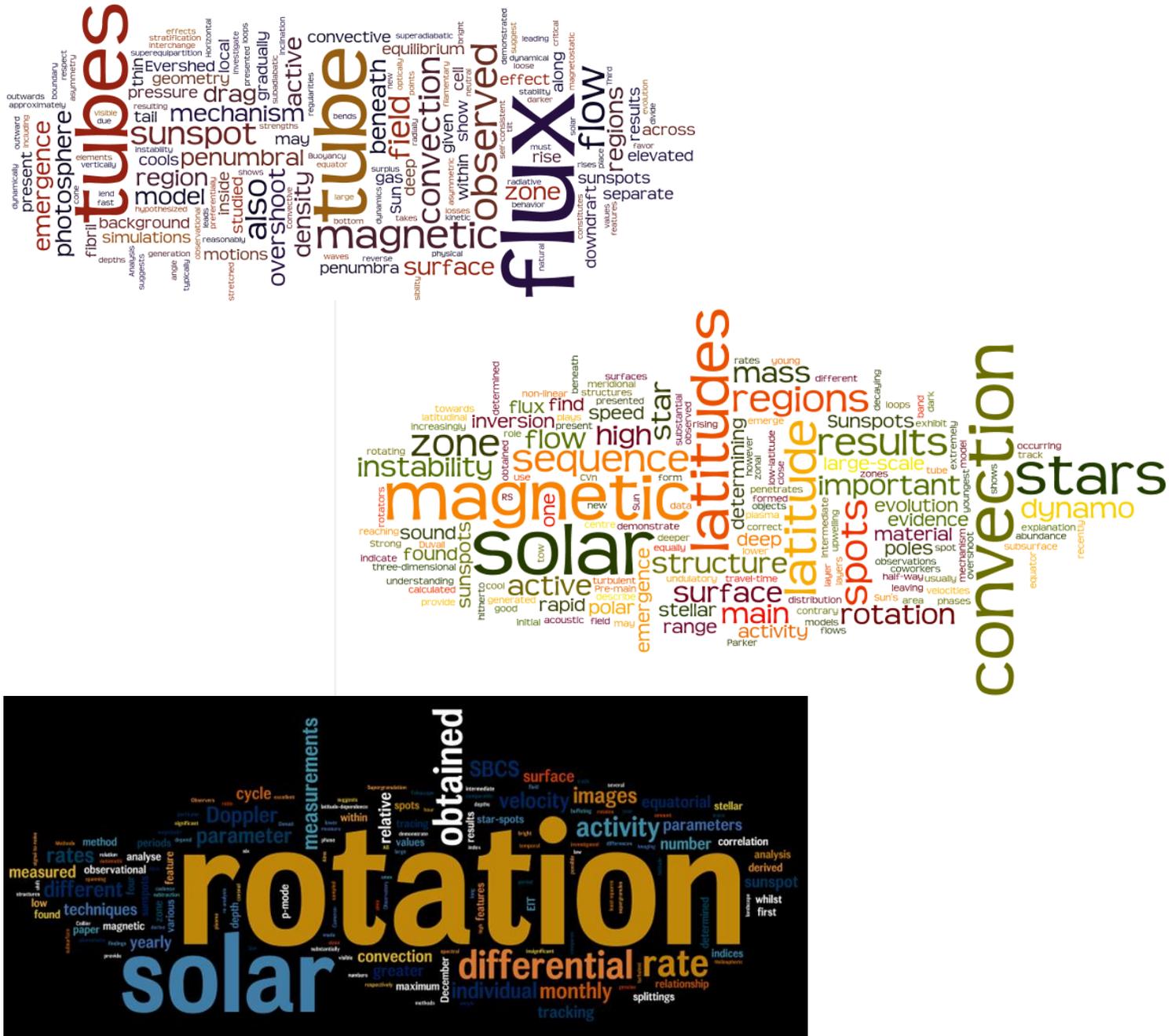
No.	Query	Hits	Evaluation
1	"Sunspot"	17,628	Too broad, must refine further
2	"Sunspot" AND "Tracking"	278	Still needs refining further
3	"Sunspot" AND "Tracking" AND "Latitude"	25	Acceptable set
4	"Sunspot " AND "Rotation"	2,026	Too broad, will use more key words
5	"Sunspot" AND "Rotation" AND "Latitude"	490	Use key words to narrow search
6	"Sunspot " AND "Magnetic" AND "Structure"	2,283	Too broad- must refine further
7	"Sunspot" AND "Magnetic" AND "Structure" AND "Rotation"	311	Useful texts for background reading

NASA Technical Report Server (NTRS) results;

No.	Query	Hits	Evaluation
1	"Sunspot"	3,405	Too broad
2	"Sunspot Motion"	5	Useful texts
3	"Solar Flares"	6,990	Too broad, will add solar max and sunspot filters
4	"Solar flares" AND "Solar maximum"	1,350	Will add sunspots
5	"Solar flares" AND "Solar maximum" AND "Sunspots"	398	Still quite broad, but reasonably acceptable set
6	"Solar flares" AND "Solar cycle"	1,331	Broad, will combine with solar maximum
7	"Solar flares" AND "Solar cycle" AND "Solar maximum"	655	Still quite broad, but reasonably acceptable set

Wordle;

The program, 'Wordle' is very helpful in finding new key words to query in a database. A few abstracts were copied into the wordle program, and produced were several mindmaps highlighting the most commonly used words from each abstract. These common words can then become part of the main search.



### Key word chart;

Abstracts of papers which were the most relevant were analysed for common key words. The results of this investigation were put into a pie chart to visually see what words were most commonly used throughout the literature search.

