

# ISO 16698:2019-12 (E)

## Space environment (natural and artificial) - Methods for estimation of future geomagnetic activity

---

<b>Contents</b>		<b>Page</b>
Foreword .....		v
Introduction .....		vi
1	Scope .....	1
2	Normative references .....	1
3	Terms and definitions .....	1
4	Symbols and abbreviated terms .....	1
5	General parameters .....	2
5.1	Geomagnetic field variations .....	2
5.2	Quiet level and disturbance fields .....	2
5.3	K index (local 3 h range index) .....	2
5.4	Kp, Kp, ap and Ap indices (planetary indices) .....	3
5.4.1	General .....	3
5.4.2	Kp index (planetary 3 h range index) .....	3
5.4.3	Kp index (planetary daily range index) .....	3
5.4.4	ap index (planetary 3 h equivalent amplitude index) .....	3
5.4.5	Ap index (planetary daily equivalent amplitude index) .....	4
5.5	aa index (antipodal amplitude index) .....	4
5.6	Dst index (storm time disturbance index) .....	4
5.7	ASY and SYM indices (mid-latitude disturbance indices) .....	5
5.8	AU, AL, AE and AO indices (auroral electrojet indices) .....	5
5.9	am index .....	6
5.10	PC index .....	7
5.11	Time lag in the derivation and temporal resolution (sampling) .....	7
6	Classification of prediction .....	8
6.1	General .....	8
6.2	Short-term prediction .....	8
6.3	Middle-term prediction .....	8
6.4	Long-term prediction .....	8
7	Methods of prediction .....	9
7.1	General .....	9
7.2	Prediction based on statistical models .....	9
7.2.1	Linear or non-linear prediction filter .....	9
7.2.2	Machine learning .....	9
7.2.3	Probabilistic prediction .....	9
7.3	Prediction based on physical principle .....	9
8	Evaluation of prediction efficiency .....	9
8.1	Definition of prediction error .....	9
8.2	Methods of evaluation .....	10
9	Compliance criteria .....	10
9.1	Rationale .....	10
9.2	Reporting .....	10

9.3	Documenting .....	10
9.4	Publishing .....	11
9.5	Archiving .....	11
10	Useful Informative Documents .....	11
	Annex A (informative) Websites where geomagnetic indices are available .....	12
	Annex B (informative) Websites where the space weather predictions and/or "now casting" are presented .....	13
	Annex C (informative) Definition of various skill scores .....	14
	Annex D (informative) Useful academic documents related with this document's fields are presented (These are not cited in the document) .....	15
	Bibliography .....	22