

## **Radio Wave Propagation**

- Hunsucker, R. D., & J. K. Hargreaves, The High-Latitude Ionosphere and its Effects on Radio Propagation, Cambridge University Press, 2003.
- Levis, C. A., J. T. Johnson, F. L. Teixeira, Radiowave propagation, John Wiley & Sons, 2010.

## **Radar**

- Stimson, Introduction to Airborne Radar, Artech, 1998.
- Levanon, Radar Principles, John Wiley & Sons 1988.
- Mahafza, Radar Signal Analysis and Processing Using MATLAB, Chapman & Hall, 2008.
- Skolnik, Introduction to radar principles, McGraw-Hill, 2002.
- Skolnik, Radar Handbook, McGraw-Hill, 2008.
- Rihaczek, Principles of High Resolution Radar, Artech House, 1996.

## **Ionosphere**

- Brekke, A., Physics of the Upper Atmosphere, John Wiley & Sons, 1997.
- Jursa, A. S., Handbook of Geophysics and the Space Environment, 4th ed., Air Force Geophysics Laboratory, Hanscom AFB, MA, USA, 1985.
- Kelley, M. C. 1989; 2009. The Earth's ionosphere: Plasma physics and electrodynamics, International Geophysics Series, vol 43. San Diego: Academic Press. (Hardcover - 2009-05-19)
- Rishbeth, H., & O. K. Garriott, Introduction to Ionospheric Physics, Academic Press, 1969.

## **Incoherent Scatter**

- Dougherty, J. P. and D. T. Farley, A Theory of Incoherent Scattering of Radio Waves by a Plasma, Proc. Royal Society of London A, 259, no. 1296, pp. 79-99, 1960.
- Dougherty, J. P. and D. T. Farley, A Theory of Incoherent Scattering of Radio Waves by a Plasma, 3. Scattering in a Partially Ionized Gas, J. Geophys. Res., 68, 19, pp. 5473-5486, 1963.
- Evans, J. V., Theory and Practice of Ionosphere Study by Thomson Scatter Radar, Proc. IEEE, 57, No 4, 496-530, 1969.
- Farley, D. T., J. P. Dougherty, and D. W. Barron, A Theory of Incoherent Scattering of Radio Waves by a Plasma II. Scattering in a Magnetic Field, Proc. Royal Society of London A, 263, pp. 238-258, 1961.
- Farley, D. T., A Theory of Incoherent Scattering of Radio Waves by a Plasma, 4. The Effect of Unequal Ion and Electron Temperatures, J. Geophys. Res., 71, 17, pp. 4091-4098, 1966.
- Kudeki, E., M. Milla, Incoherent scatter spectrum theory for modes propagating perpendicular to the geomagnetic field, J. Geophys. Res., 111, A06306, doi:10.1029/2005JA011546, 2006.
- Lehtinen, M. S., Statistical Theory of Incoherent Scatter Radar Measurements, EISCAT Technical Note 86/45, EISCAT, Kiruna, Sweden, 1986. (pdf)
- Milla, M., and E. Kudeki, Particle dynamics description of "BGK collisions" as a Poisson process, J. Geophys. Res., 114, A07302, doi:10.1029/2009JA014200, 2009.
- Rishbeth, H., and P. J. S. Williams, The EISCAT Ionospheric Radar: the System and its Early Results, Quart. J. Royal Astr. Soc., 26, 478-512, 1985.
- Swartz, W. E. and D. T. Farley, A Theory of Incoherent Scattering of Radio Waves by a Plasma, 5. The Use of the Nyquist Theorem in General Quasi-Equilibrium Situations, J. Geophys. Res., 84, A5, pp. 1930-1932, 1979.
- Van Trees, H. L., Detection, Estimation, and Modulation theory, part III, John Wiley & Sons, New York, 1971.
- Wannberg, G., I. Wolf, L.-G. Vanhainen, K. Koskenniemi, J. Röttger, M. Postila, J. Markkanen, R. Jacobsen, A. Stenberg, R. Larsen, S. Eliassen, S. Heck, and A. Huuskonen, The EISCAT Svalbard

radar: A case study in modern incoherent scatter radar system design, Radio Sci., 32, 2283-2307, 1997.

## Inverse Methods

- Aster, Borchers and Thurber, Parameter Estimation and Inverse Problems, International Geophysics Series, Academic Press, 2005
- Tarantola, A., Inverse Problem Theory, Siam, 2005. (link)

You can download those which are marked “(pdf)” or “(link)”; please visit

<http://www.sgo.fi/Events/RS2010/>

## Links and Resources

Greenland radar school at MIT:

[http://www.haystack.mit.edu/cgi-bin/asg\\_science/science.cgi/International\\_ISR\\_Workshop](http://www.haystack.mit.edu/cgi-bin/asg_science/science.cgi/International_ISR_Workshop)

Greenland radar school at SGO:

<http://www.sgo.fi/Greenland2011/>

EISCAT	<a href="http://www.eiscat.se/">http://www.eiscat.se/</a>
EISCAT_3D	<a href="http://www.eiscat3d.org/">http://www.eiscat3d.org/</a>
EISCAT_3D blog	<a href="http://blog.eiscat3d.org/">http://blog.eiscat3d.org/</a>
Facebook	<a href="http://www.facebook.com/EISCAT3D">http://www.facebook.com/EISCAT3D</a>
Twitter	<a href="http://twitter.com/EISCAT_3D">http://twitter.com/EISCAT_3D</a>

Incoherent Scatter Spectrum simulation

[http://www.haystack.mit.edu/cgi-bin/asg\\_science/science.cgi/ISR\\_Demonstration](http://www.haystack.mit.edu/cgi-bin/asg_science/science.cgi/ISR_Demonstration)

Madrigal:

[http://www.haystack.mit.edu/cgi-bin/asg\\_science/science.cgi/Using\\_Madrigal\\_practically\\_and\\_productively](http://www.haystack.mit.edu/cgi-bin/asg_science/science.cgi/Using_Madrigal_practically_and_productively)

Phased arrays: an explanation of how phased arrays work has been written by Derek McKay-Bukowski and published on the KAIRA blog:

<http://kaira.sgo.fi/search/label/how%20it%20works>

## Future

15th International EISCAT Workshop, 5th-9th September 2011, Qingdao, China:

<http://bit.ly/EISCATWS2011>

COSPAR 2012, 14th to 22nd July 2012, Mysore, India, Session C02 “New Generation of Middle and Upper Atmosphere Radars: Application and Development”, conveners Thomas Ulich and Anja Strømme:

<http://www.cospar2012india.org/>