Rayleigh Wave Diagnostics

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Problem with Epsilon Parameter Testing

--Looking to equation (16) in Vuk's note, epsilon characterizes how much an R-wave resembles either a P-wave or an S-wave. If epsilon is large, the R-wave resembles an S-wave, and if epsilon is small, the R-wave resembles a P-wave.

--If epsilon is large (~10) or small (~0.2), we can successfully recover the direction of the R-wave

--If epsilon is a middle value (~between 0.6 and 8), we cannot successfully recover the direction of the wave

Epsilon Tests

The Following parameters are kept constant while epsilon is varied:

Amplitude = 10 m

Speed = 3000 m/s

Frequency= 4 Hz
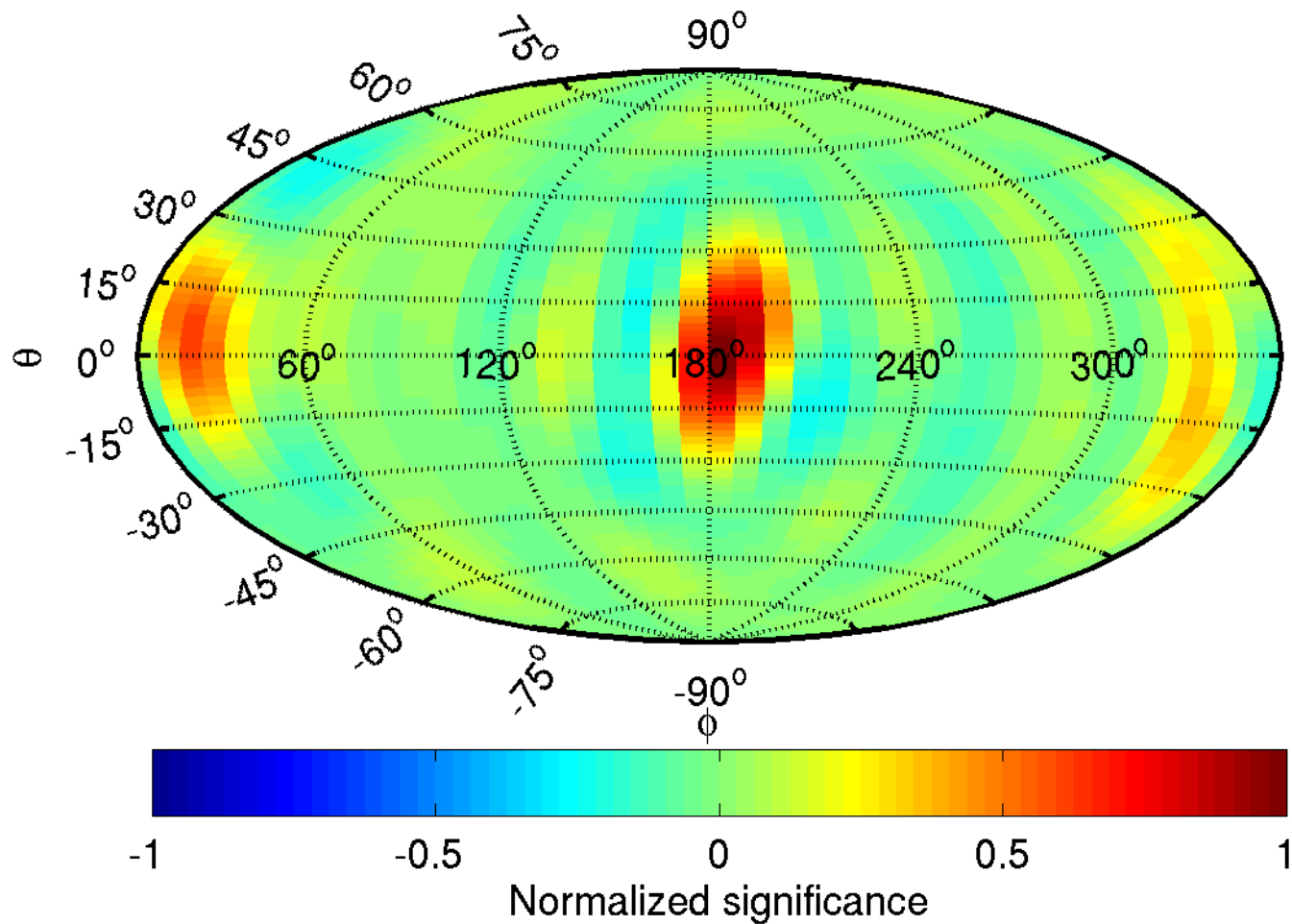
Alpha = 500 m

Phi = 180 degrees

Theta = 0 degrees

Detector locations (m):

235.6000 225.6000 225.6000
225.7000 297.8000 135.0000
537.5000 983.3000 439.6000
989.1000 89.2000 175.5000
897.0000 728.6000 950.1000
816.3000 891.4000 231.3000
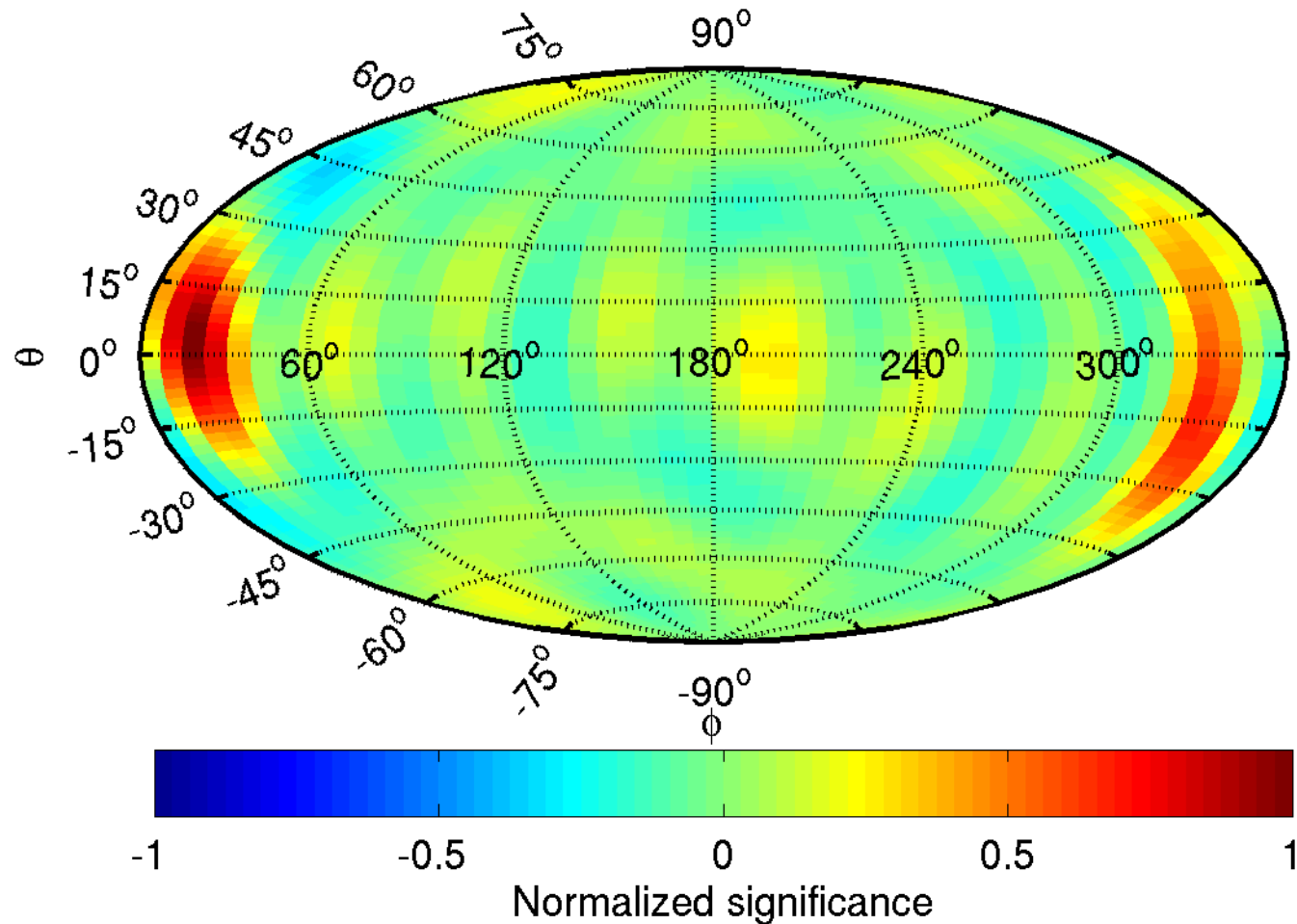151.4000 520.9000 708.4000
126.4000 503.7000 812.4000

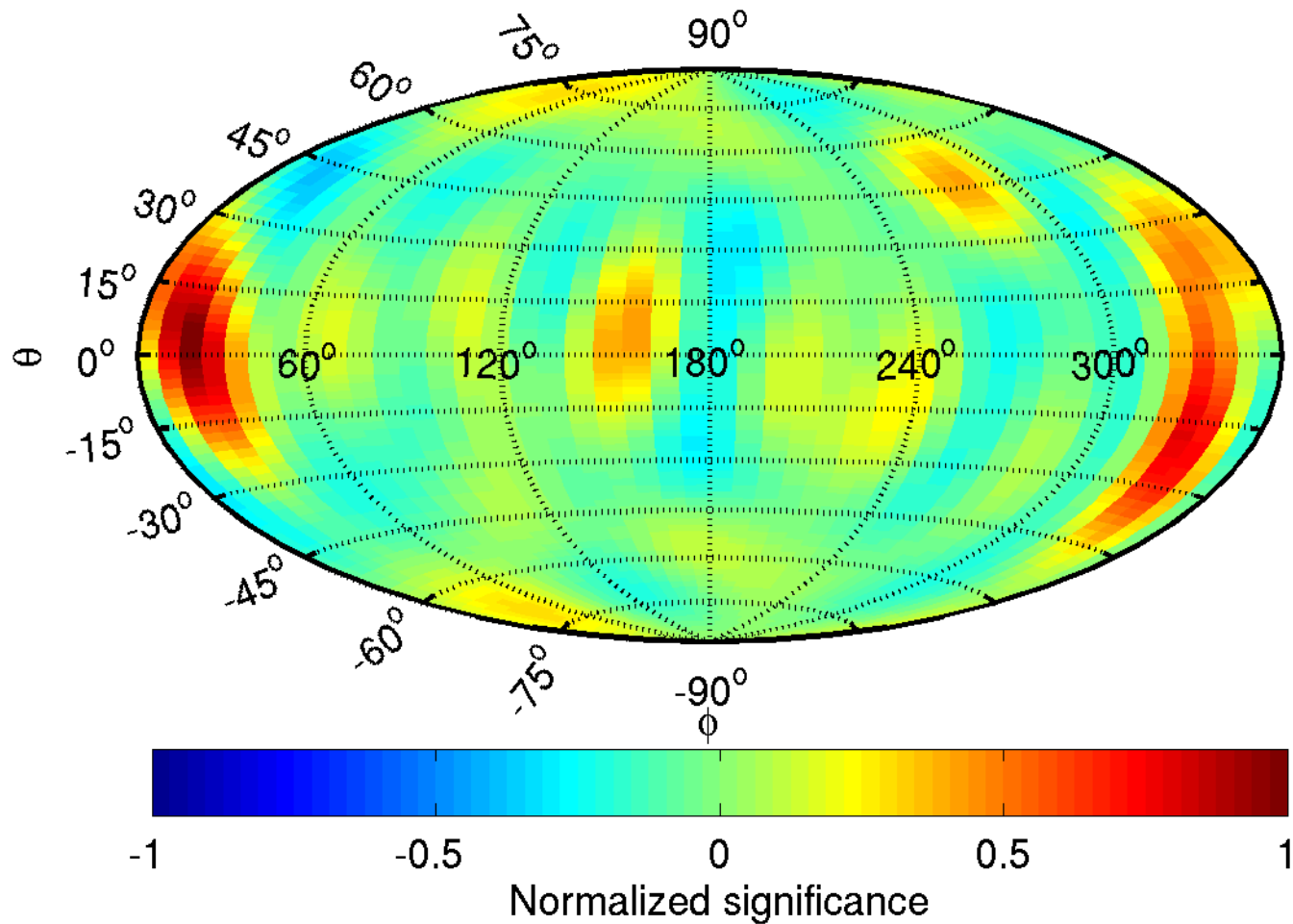# Test 1—Epsilon = 0.2

1 source, radiometer, 8 stations

Normalized significance

Test 2—Epsilon = 0.8

Test 3—Epsilon = 1.3

1 source, radiometer, 8 stations

Test 4—Epsilon = 5

1 source, radiometer, 8 stations

Normalized significance
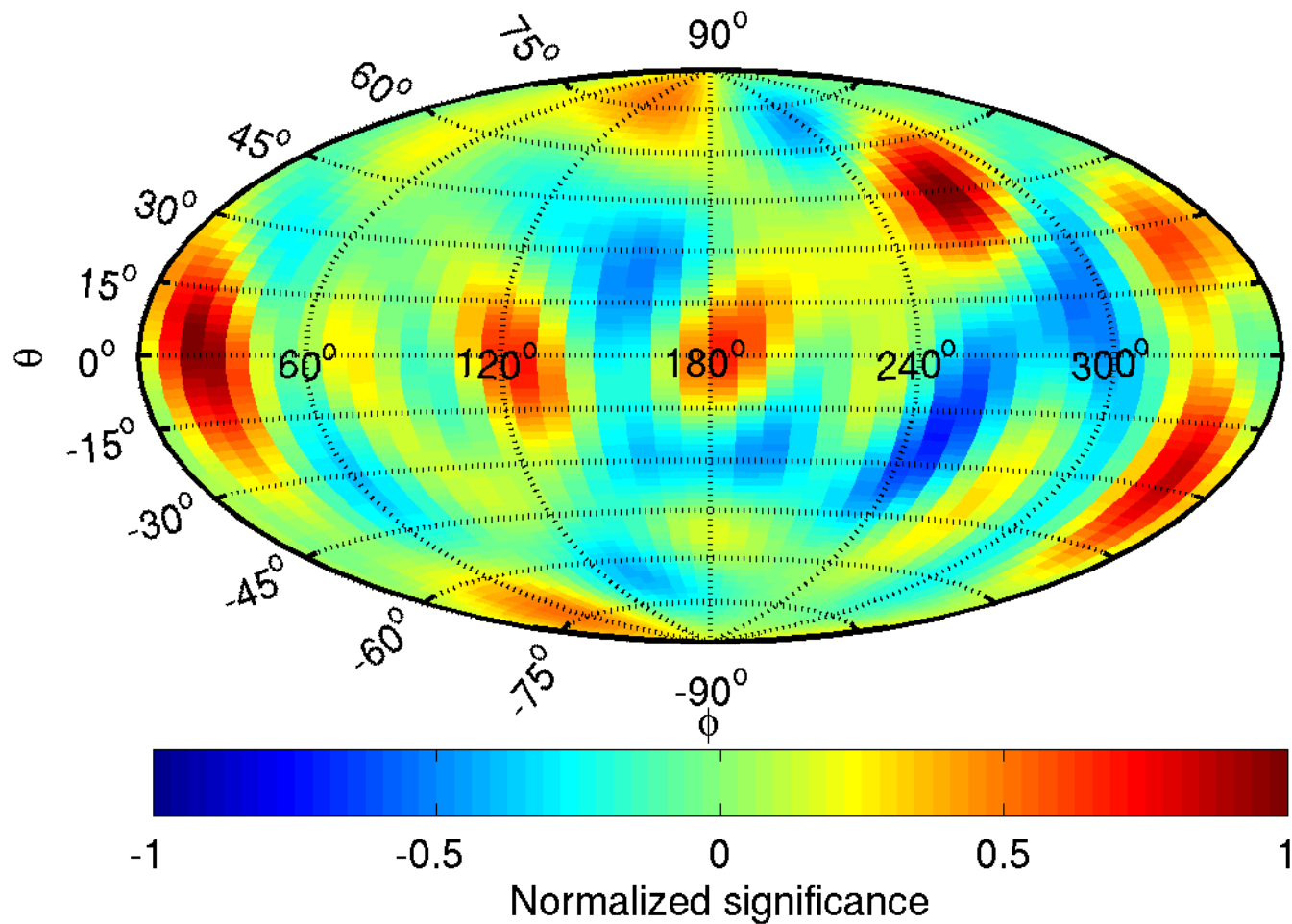
Test 5—Epsilon = 8

1 source, radiometer, 8 stations
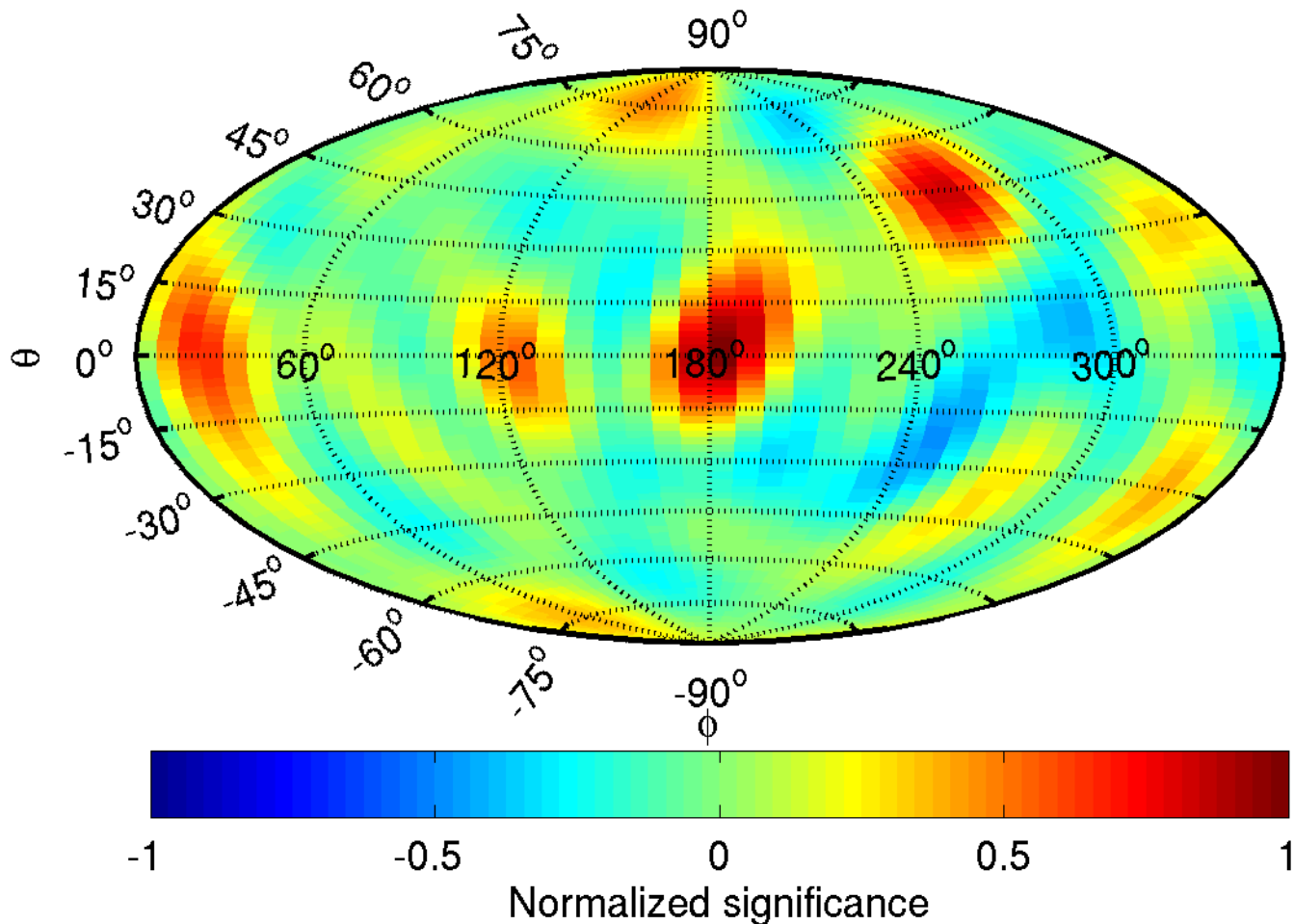
Test 6—Epsilon = 10

1 source, radiometer, 8 stations