
SIO227A Homework

5: 6.2 (Eric Gallimore)

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Ch 6 #2

Data input

Values from IASP model, in [deg, s, s/deg]

```
iasp = [29,361.41,8.89; 30,370.27,8.85; 31,379.10,8.81;59,601.38,6.95;60,608.29,6.95;61,615.21,6.91;62,622.03,6.87;63,628.85,6.83;64,635.67,6.79;65,642.49,6.75;66,649.31,6.71;67,656.13,6.67;68,662.95,6.63;69,669.77,6.59;70,676.59,6.55;71,683.41,6.51;72,690.23,6.47;73,697.05,6.43;74,703.87,6.39;75,710.69,6.35;76,717.51,6.31;77,724.33,6.27;78,731.15,6.23;79,737.97,6.19;80,744.79,6.15;81,751.61,6.11;82,758.43,6.07;83,765.25,6.03;84,772.07,5.99;85,778.89,5.95;86,785.71,5.91;87,792.53,5.87;88,799.35,5.83;89,806.17,5.79;90,812.99,5.75;91,819.81,5.71;92,826.63,5.67;93,833.45,5.63;94,840.27,5.59;95,847.09,5.55;96,853.91,5.51;97,860.73,5.47;98,867.55,5.43;99,874.37,5.39;100,881.19,5.35;101,888.01,5.31;102,894.83,5.27;103,901.65,5.23;104,908.47,5.19;105,915.29,5.15;106,922.11,5.11;107,928.93,5.07;108,935.75,5.03;109,942.57,4.99;110,949.39,4.95;111,956.21,4.91;112,963.03,4.87;113,969.85,4.83;114,976.67,4.79;115,983.49,4.75;116,990.31,4.71;117,997.13,4.67;118,1003.95,4.63;119,1010.77,4.59;120,1017.59,4.55;121,1024.41,4.51;122,1031.23,4.47;123,1038.05,4.43;124,1044.87,4.39;125,1051.69,4.35;126,1058.51,4.31;127,1065.33,4.27;128,1072.15,4.23;129,1078.97,4.19;130,1085.79,4.15;131,1092.61,4.11;132,1099.43,4.07;133,1106.25,4.03;134,1113.07,3.99;135,1119.89,3.95;136,1126.71,3.91;137,1133.53,3.87;138,1140.35,3.83;139,1147.17,3.79;140,1153.99,3.75;141,1160.81,3.71;142,1167.63,3.67;143,1174.45,3.63;144,1181.27,3.59;145,1188.09,3.55;146,1194.91,3.51;147,1201.73,3.47;148,1208.55,3.43;149,1215.37,3.39;150,1222.19,3.35;151,1229.01,3.31;152,1235.83,3.27;153,1242.65,3.23;154,1249.47,3.19;155,1256.29,3.15;156,1263.11,3.11;157,1269.93,3.07;158,1276.75,3.03;159,1283.57,2.99;160,1290.39,2.95;161,1297.21,2.91;162,1304.03,2.87;163,1310.85,2.83;164,1317.67,2.79;165,1324.49,2.75;166,1331.31,2.71;167,1338.13,2.67;168,1344.95,2.63;169,1351.77,2.59;170,1358.59,2.55;171,1365.41,2.51;172,1372.23,2.47;173,1379.05,2.43;174,1385.87,2.39;175,1392.69,2.35;176,1399.51,2.31;177,1406.33,2.27;178,1413.15,2.23;179,1419.97,2.19;180,1426.79,2.15;181,1433.61,2.11;182,1440.43,2.07;183,1447.25,2.03;184,1454.07,1.99;185,1460.89,1.95;186,1467.71,1.91;187,1474.53,1.87;188,1481.35,1.83;189,1488.17,1.79;190,1494.99,1.75;191,1501.81,1.71;192,1508.63,1.67;193,1515.45,1.63;194,1522.27,1.59;195,1529.09,1.55;196,1535.91,1.51;197,1542.73,1.47;198,1549.55,1.43;199,1556.37,1.39;200,1563.19,1.35;201,1569.97,1.31;202,1576.79,1.27;203,1583.61,1.23;204,1590.43,1.19;205,1597.25,1.15;206,1604.07,1.11;207,1610.89,1.07;208,1617.71,1.03;209,1624.53,0.99;210,1631.35,0.95;211,1638.17,0.91;212,1644.99,0.87;213,1651.81,0.83;214,1658.63,0.79;215,1665.45,0.75;216,1672.27,0.71;217,1679.09,0.67;218,1685.91,0.63;219,1692.73,0.59;220,1699.55,0.55;221,1706.37,0.51;222,1713.19,0.47;223,1719.97,0.43;224,1726.79,0.39;225,1733.61,0.35;226,1740.43,0.31;227,1747.25,0.27;228,1754.07,0.23;229,1760.89,0.19;230,1767.71,0.15;231,1774.53,0.11;232,1781.35,0.07;233,1788.17,0.03;234,1794.99,0.00;235,1801.81,0.00;236,1808.63,0.00;237,1815.45,0.00;238,1822.27,0.00;239,1829.09,0.00;240,1835.91,0.00;241,1842.73,0.00;242,1849.55,0.00;243,1856.37,0.00;244,1863.19,0.00;245,1869.97,0.00;246,1876.79,0.00;247,1883.61,0.00;248,1890.43,0.00;249,1897.25,0.00;250,1904.07,0.00;251,1910.89,0.00;252,1917.71,0.00;253,1924.53,0.00;254,1931.35,0.00;255,1938.17,0.00;256,1944.99,0.00;257,1951.81,0.00;258,1958.63,0.00;259,1965.45,0.00;260,1972.27,0.00;261,1979.09,0.00;262,1985.91,0.00;263,1992.73,0.00;264,1999.55,0.00;265,2006.37,0.00;266,2013.19,0.00;267,2019.97,0.00;268,2026.79,0.00;269,2033.61,0.00;270,2040.43,0.00;271,2047.25,0.00;272,2054.07,0.00;273,2060.89,0.00;274,2067.71,0.00;275,2074.53,0.00;276,2081.35,0.00;277,2088.17,0.00;278,2094.99,0.00;279,2101.81,0.00;280,2108.63,0.00;281,2115.45,0.00;282,2122.27,0.00;283,2129.09,0.00;284,2135.91,0.00;285,2142.73,0.00;286,2149.55,0.00;287,2156.37,0.00;288,2163.19,0.00;289,2169.97,0.00;290,2176.79,0.00;291,2183.61,0.00;292,2190.43,0.00;293,2197.25,0.00;294,2204.07,0.00;295,2210.89,0.00;296,2217.71,0.00;297,2224.53,0.00;298,2231.35,0.00;299,2238.17,0.00;300,2244.99,0.00;301,2251.81,0.00;302,2258.63,0.00;303,2265.45,0.00;304,2272.27,0.00;305,2279.09,0.00;306,2285.91,0.00;307,2292.73,0.00;308,2299.55,0.00;309,2306.37,0.00;310,2313.19,0.00;311,2319.97,0.00;312,2326.79,0.00;313,2333.61,0.00;314,2340.43,0.00;315,2347.25,0.00;316,2354.07,0.00;317,2360.89,0.00;318,2367.71,0.00;319,2374.53,0.00;320,2381.35,0.00;321,2388.17,0.00;322,2394.99,0.00;323,2401.81,0.00;324,2408.63,0.00;325,2415.45,0.00;326,2422.27,0.00;327,2429.09,0.00;328,2435.91,0.00;329,2442.73,0.00;330,2449.55,0.00;331,2456.37,0.00;332,2463.19,0.00;333,2469.97,0.00;334,2476.79,0.00;335,2483.61,0.00;336,2490.43,0.00;337,2497.25,0.00;338,2504.07,0.00;339,2510.89,0.00;340,2517.71,0.00;341,2524.53,0.00;342,2531.35,0.00;343,2538.17,0.00;344,2544.99,0.00;345,2551.81,0.00;346,2558.63,0.00;347,2565.45,0.00;348,2572.27,0.00;349,2579.09,0.00;350,2585.91,0.00;351,2592.73,0.00;352,2599.55,0.00;353,2606.37,0.00;354,2613.19,0.00;355,2619.97,0.00;356,2626.79,0.00;357,2633.61,0.00;35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```

```
% Use 6.23
E_coeff = (p ./ ((4*pi*u1^2*r1^2*r2^2) .* (cos(theta).^2) .* sin(Delta))) .* abs(d)
% Take square root to get amplitudes
amp_coeff = sqrt(E_coeff);

% Look at the results for 30, 60, 90 deg.
idx = ismember(iasp(:,1), [30, 60, 90]);
amp = amp_coeff(idx);

% Compare the values at 60 and 90 deg to 30 deg (make 30 unity)
amp_scaled = (1/amp(1)) .* amp;
```

Results

and print the results

```
fprintf('Distance (deg)\tRelative Amplitude\n');
fprintf('30\t\t%.4f\n', amp_scaled(1));
fprintf('60\t\t%.4f\n', amp_scaled(2));
fprintf('90\t\t%.4f\n', amp_scaled(3));
```

```
Distance (deg) Relative Amplitude
30  1.0000
60  0.7132
90  0.2136
```

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