

PlanarRad

Result sheet for Hydrolight comparison

automatically generated on machine `maxwell` on:

Mon 02 Sep 2024 05:42:42 AM UTC

Introduction

This is an automatically generated document constructed from a PlanarRad installation test script. It compares the quad-averaged radiance outputs from PlanarRad to a dataset derived from a series of runs of Hydrolight version 4.2. The run configurations are split into two groups. The first set, with codes `jod` through `jos` were conducted with a flat air-water interface and a Hydrolight idealised sky model with $C = 0$ and diffuse fraction 0.3 with a solar zenith angle of $\theta_S = 0$ or $\theta_S = 30^\circ$, $\phi_S = 0$. Depths range from 1 m to 125 m, bottom Lambertian reflectance R is 0.7, 0.0 or 1.0, and single scattering albedos from 0 to 1.0. See Table 1 below. Not all of these run configurations are yet included in this document. The second set of configurations `jowa` through `jowe` were designed to compare the azimuthally averaged wind-blown air-water interface functions for wind speeds of 0 ms^{-1} , 0.5 ms^{-1} , 3 ms^{-1} and 10 ms^{-1} . Plots show quad-averaged radiance in the solar plane and at right-angles to the solar plane, $\phi = 90^\circ$. Theta angles are in the Hydrolight style, so that $\theta = 0$ is either directly upward or downward dependent on the context.

Acknowledgements

The Hydrolight data was provided by Ellsworth LeDrew and Alan Lim of the University of Waterloo, Canada.

Notes

1. Since `gnuplot` fails when plotting data of all zeros on a log axis, result sets of all zeros are replaced by `1e-100`. Hence plots which appear uniform at `1e-100` are in reality all zero values.
2. The Hydrolight run `jof08` had an error in the parameter set-up so is not included here.
3. Bear in mind any discrepancies or other features of the plots may be caused by bugs in the document generation script and so not directly attributable to PlanarRad or Hydrolight.

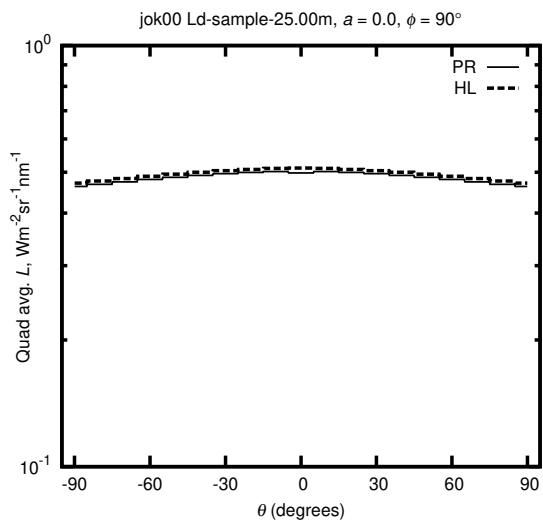
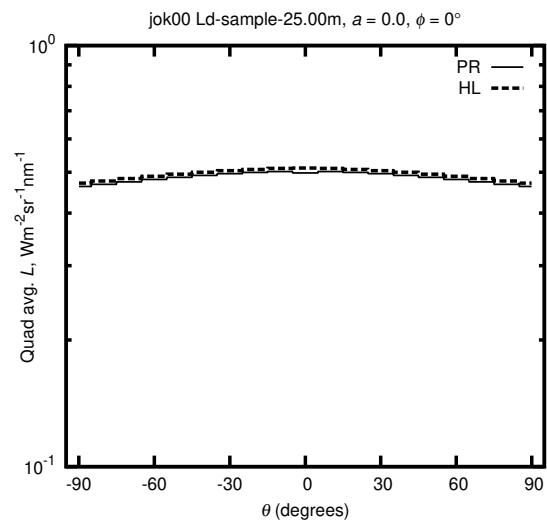
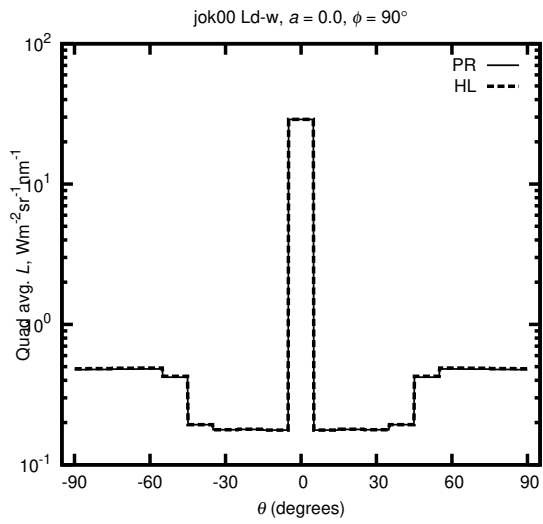
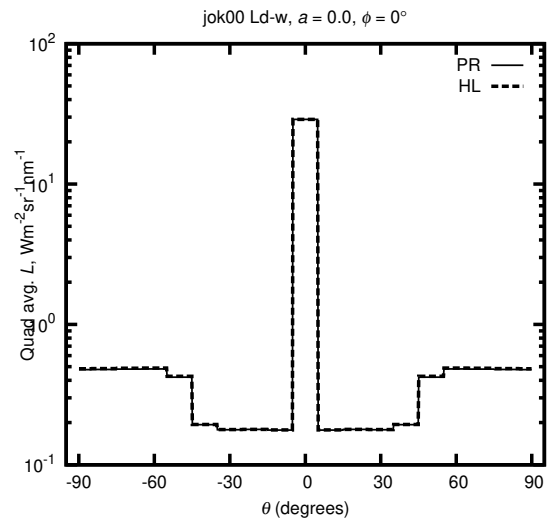
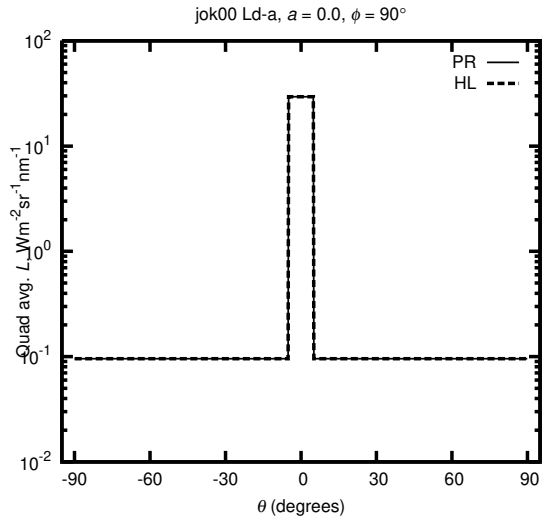
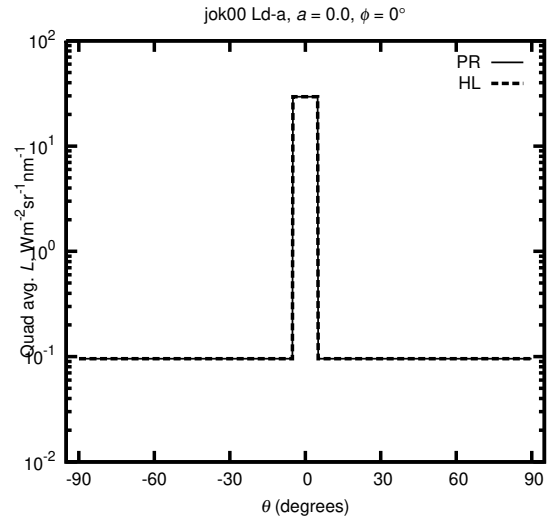
Table 1: Test run configurations

code	depth (m)	a	b	c	phase func.	R	θ_S	page
jod	1	0, 0.2, 0.4, 0.6, 0.8, 1.0	1.0, 0.8, 0.6, 0.4, 0.2, 0	1.0	isotropic	0.7	0	-
joe	5	0, 0.2, 0.4, 0.6, 0.8, 1.0	1.0, 0.8, 0.6, 0.4, 0.2, 0	1.0	isotropic	0.7	0	-
jof	25	0, 0.2, 0.4, 0.6, 0.8, 1.0	1.0, 0.8, 0.6, 0.4, 0.2, 0	1.0	isotropic	0.7	0	-
jog	125	0, 0.2, 0.4, 0.6, 0.8, 1.0	1.0, 0.8, 0.6, 0.4, 0.2, 0	1.0	isotropic	0.7	0	-
joj	1	0, 0.2, 0.4, 0.6, 0.8, 1.0	1.0, 0.8, 0.6, 0.4, 0.2, 0	1.0	Petzold	0.7	0	-
joi	5	0, 0.2, 0.4, 0.6, 0.8, 1.0	1.0, 0.8, 0.6, 0.4, 0.2, 0	1.0	Petzold	0.7	0	-
joj	25	0, 0.2, 0.4, 0.6, 0.8, 1.0	1.0, 0.8, 0.6, 0.4, 0.2, 0	1.0	Petzold	0.7	0	-
jok	125	0, 0.2, 0.4, 0.6, 0.8, 1.0	1.0, 0.8, 0.6, 0.4, 0.2, 0	1.0	Petzold	0.7	0	-
jol	5	0, 0.2, 0.4, 0.6, 0.8, 1.0	1.0, 0.8, 0.6, 0.4, 0.2, 0	1.0	Petzold	0	30	-
jos	125	0	1.0	1.0	isotropic	1.0	0	-

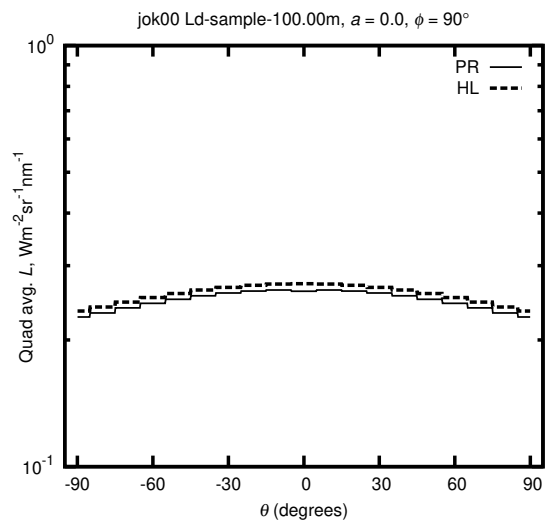
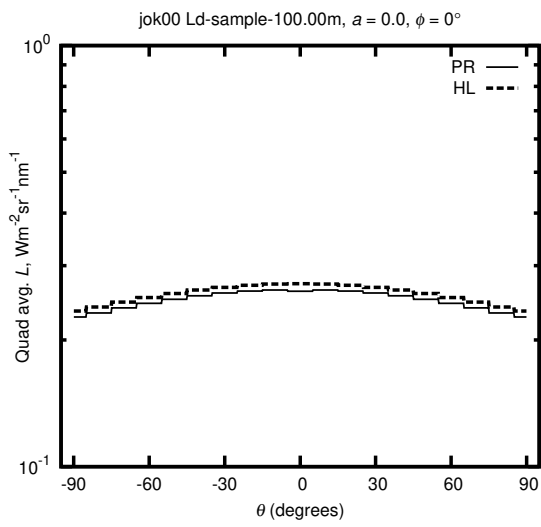
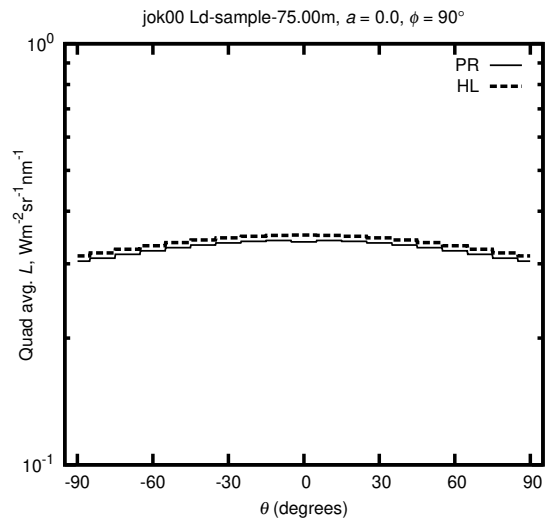
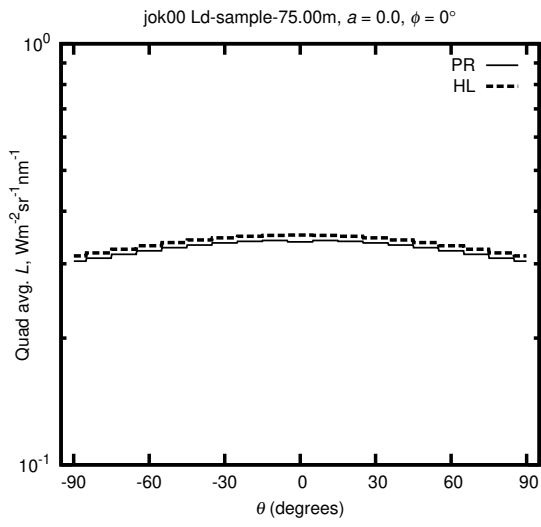
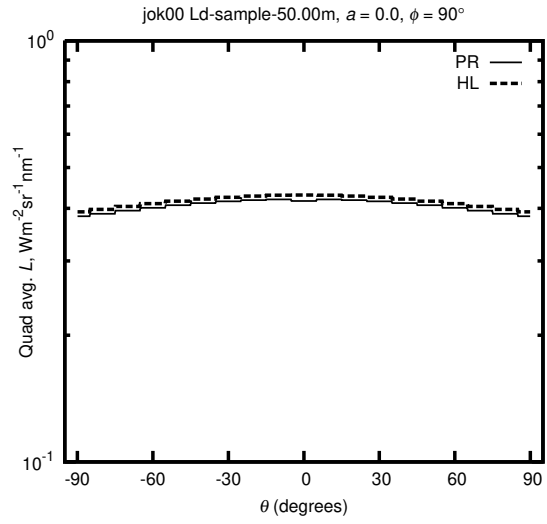
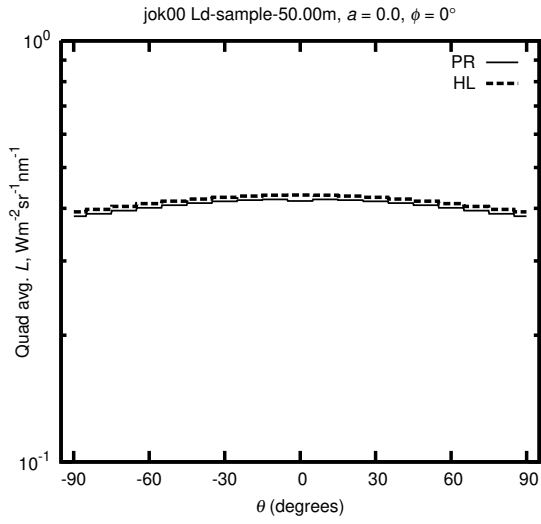
Table 2: Meaning of figure caption codes

Ld	downward directed radiance
Lu	upward directed radiance
-a	just above the water surface
-w	just below the water surface
-it	component transmitted through the air-water interface
-ir	component reflected from the air-water interface
-sample-1.00m	at depth 1.00 m below the water surface, etc.
PR	PlanarRad
HL	Hydrolight

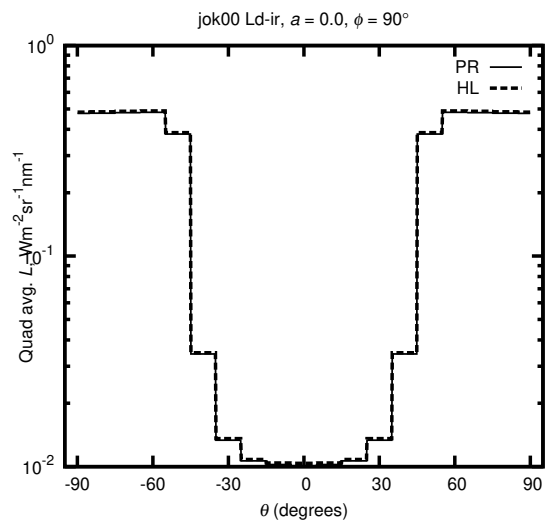
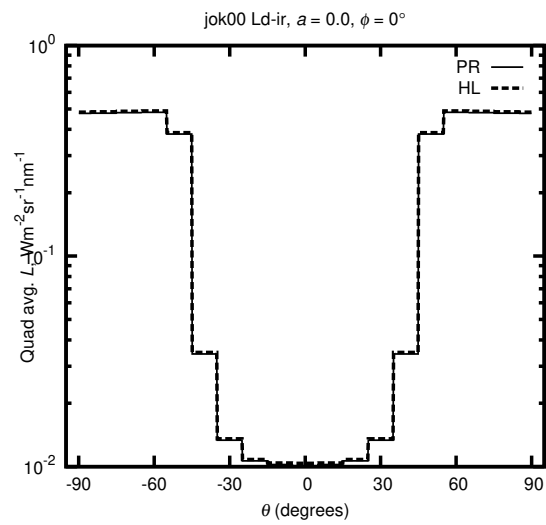
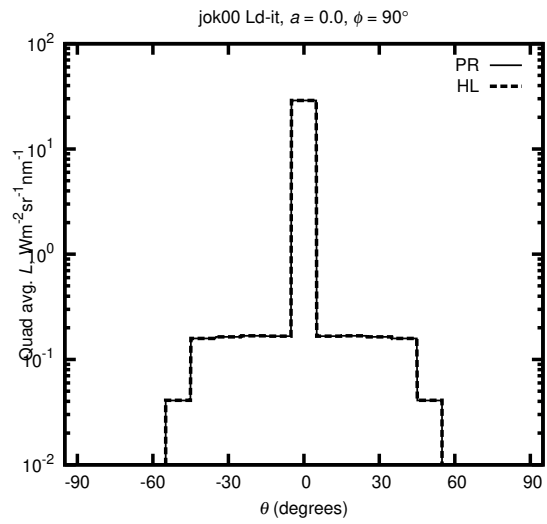
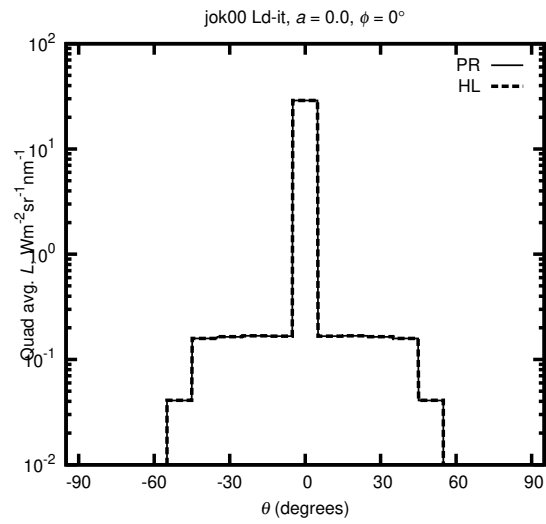
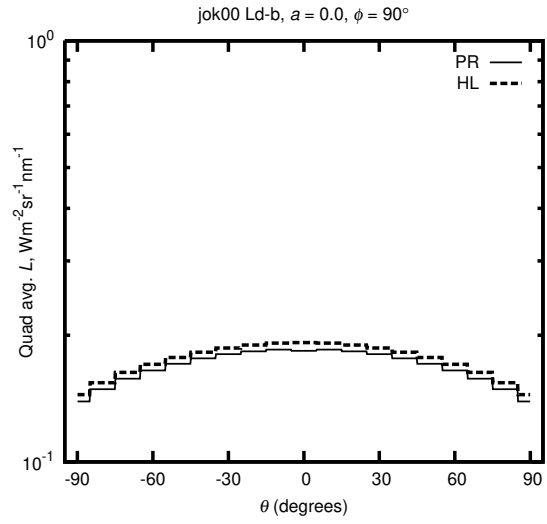
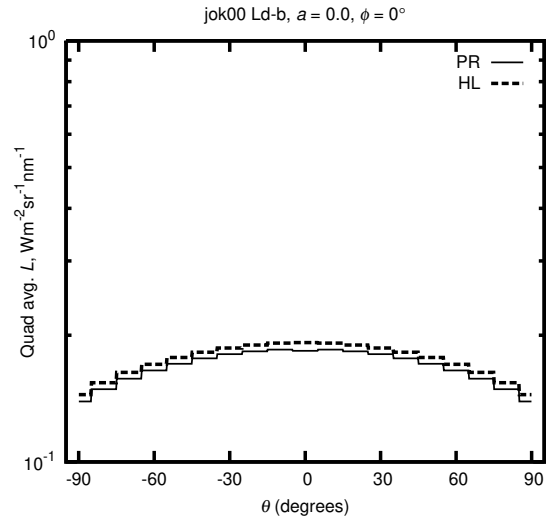
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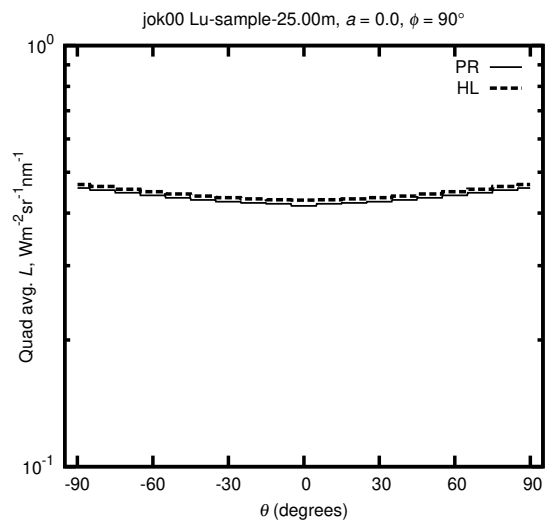
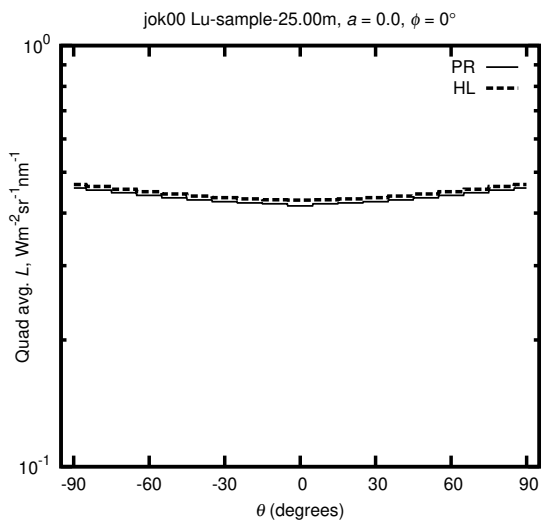
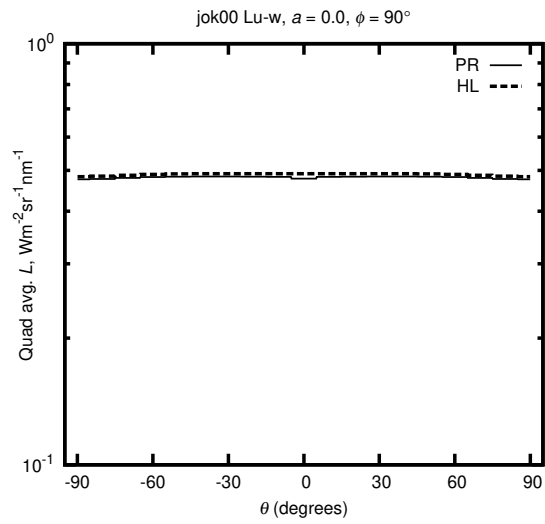
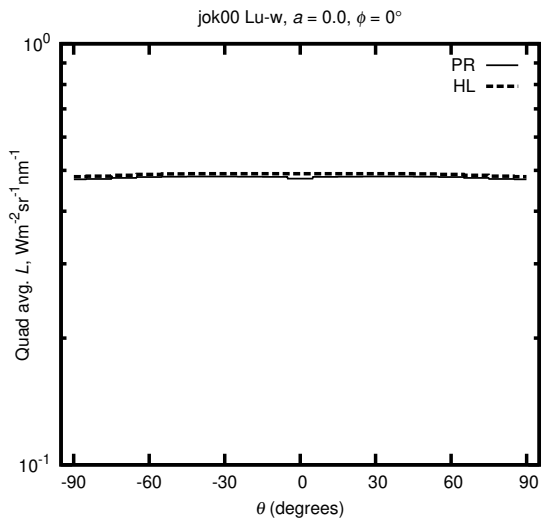
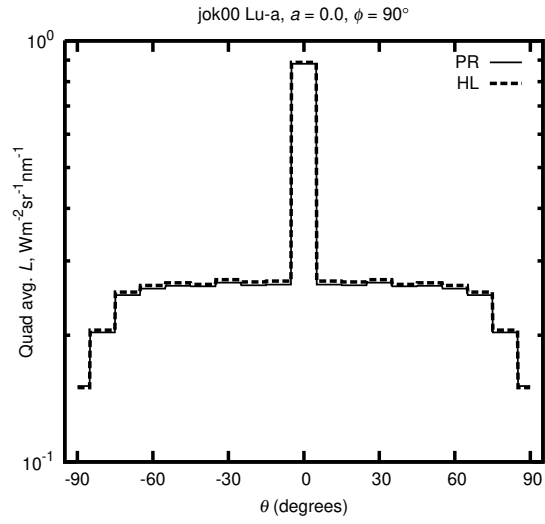
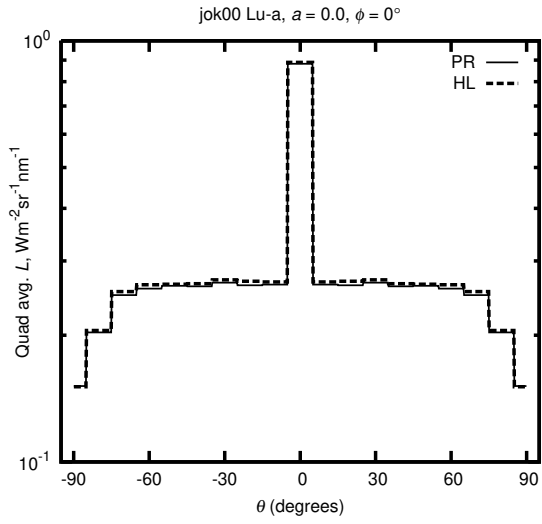
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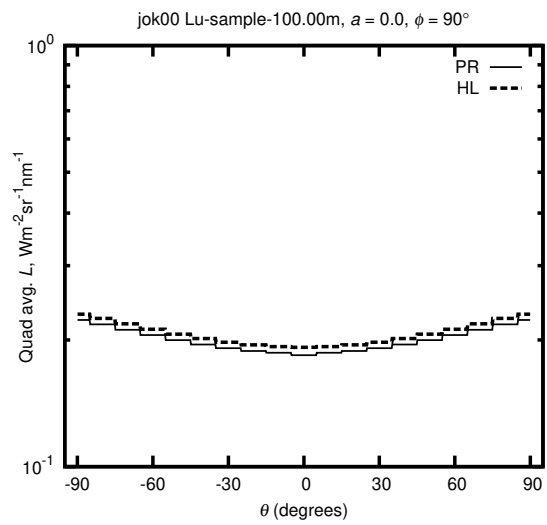
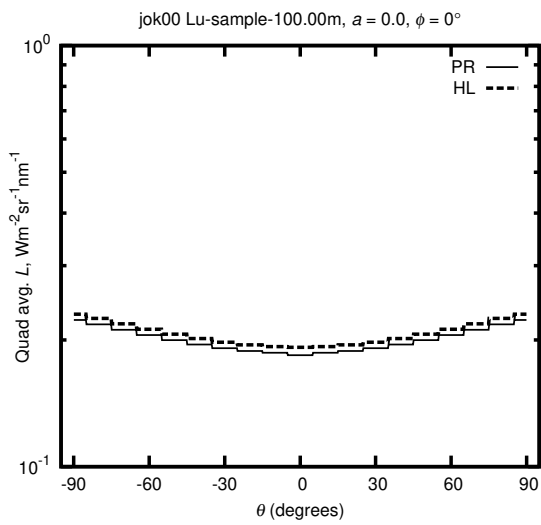
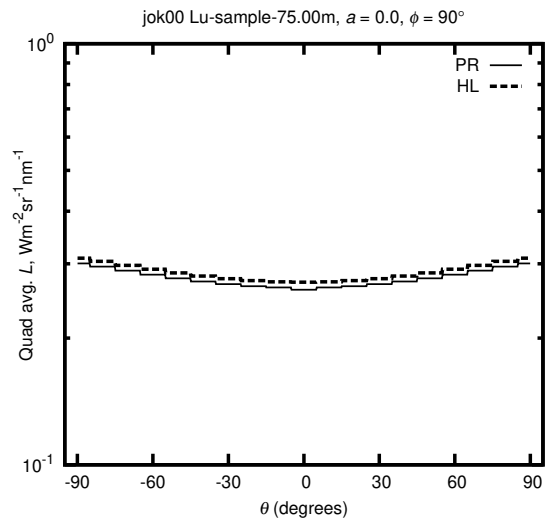
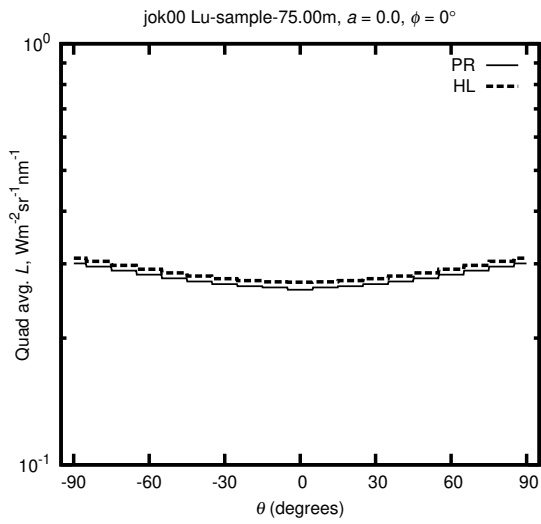
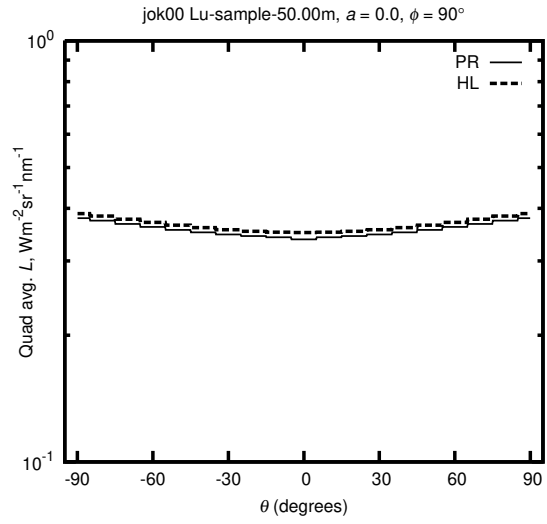
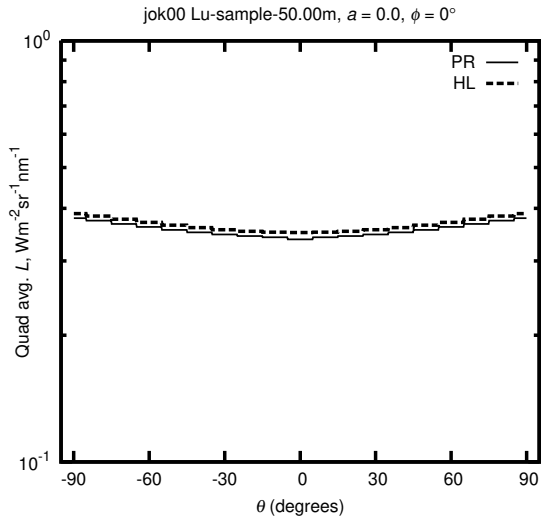
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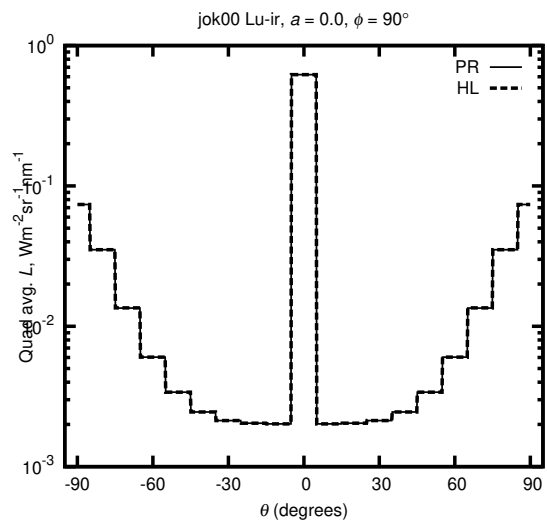
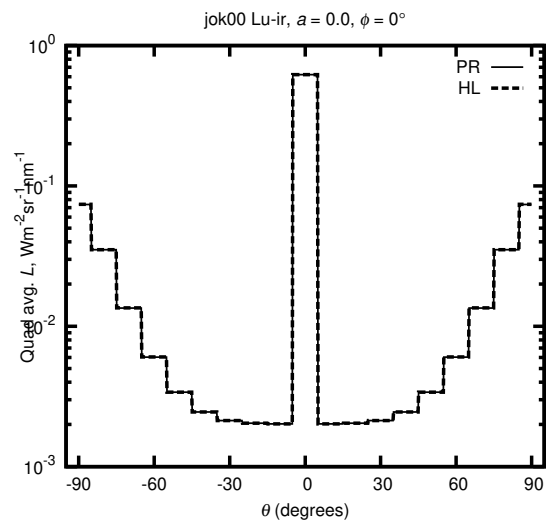
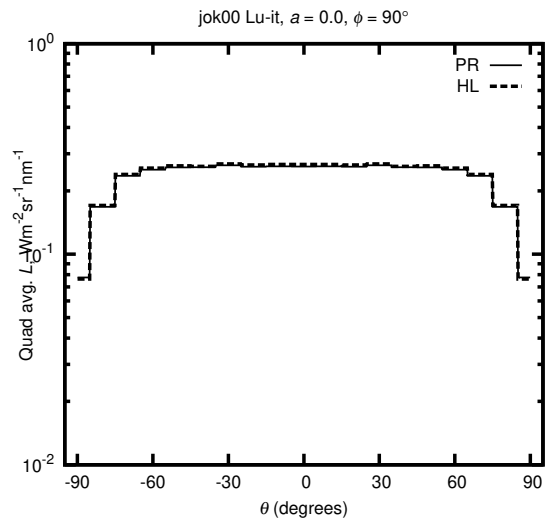
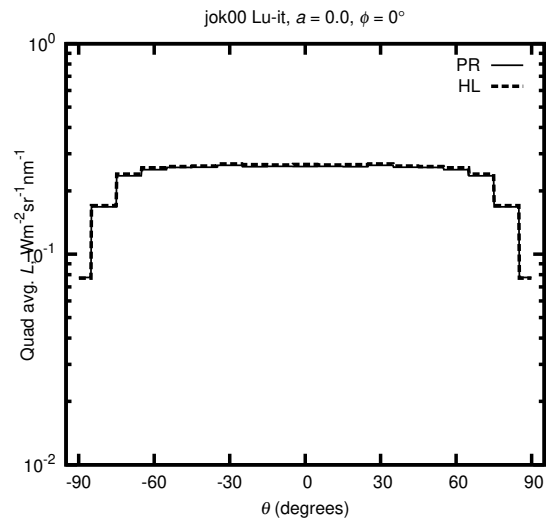
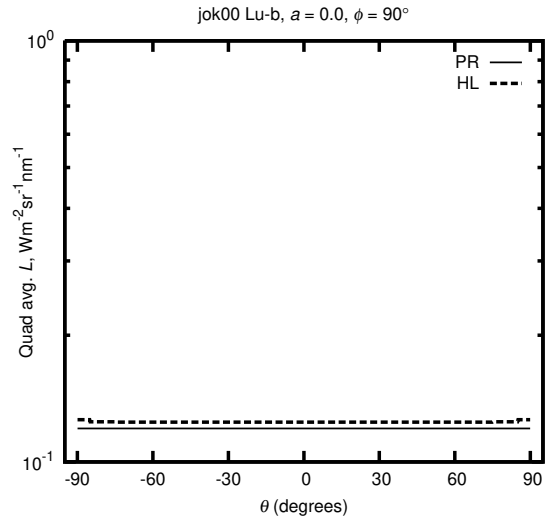
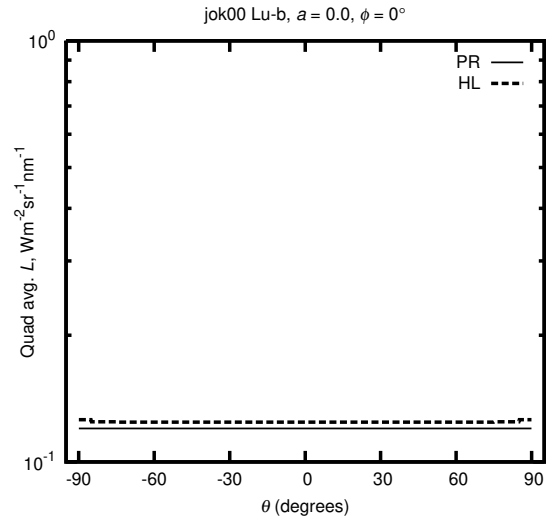
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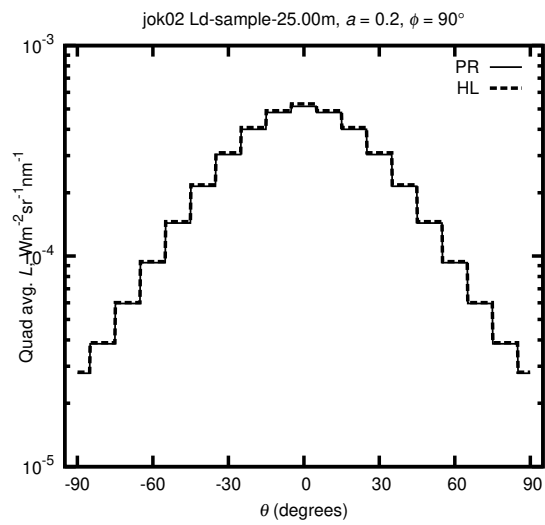
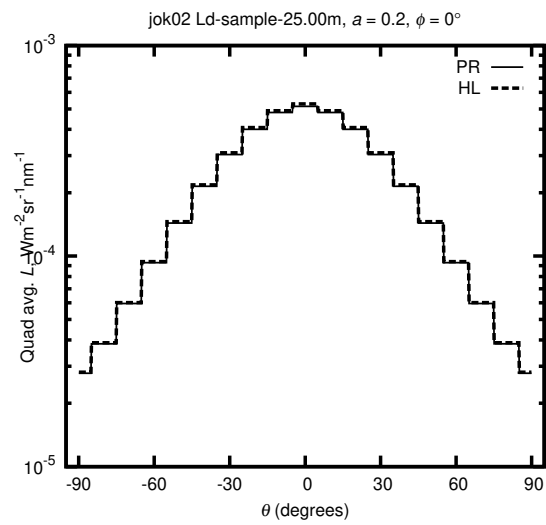
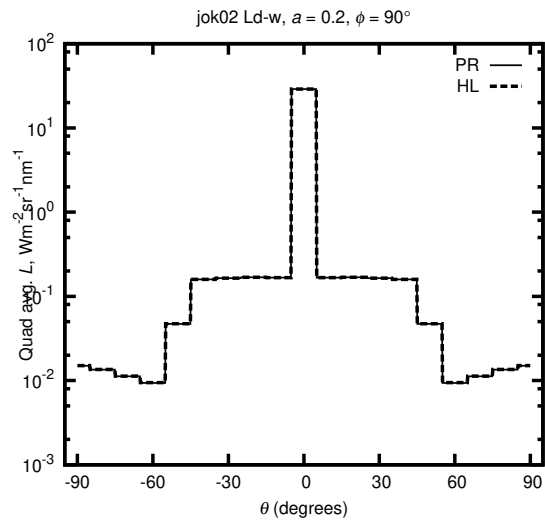
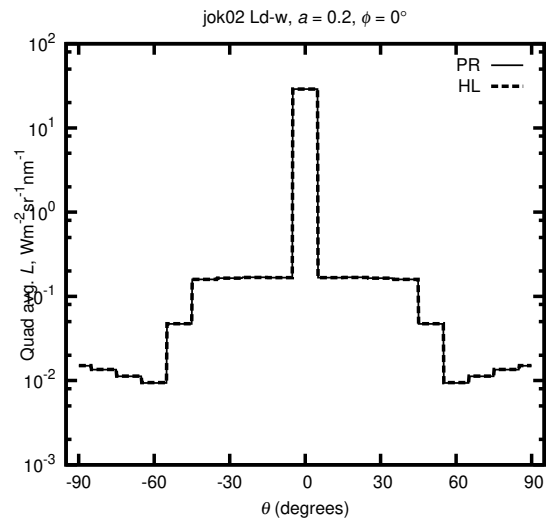
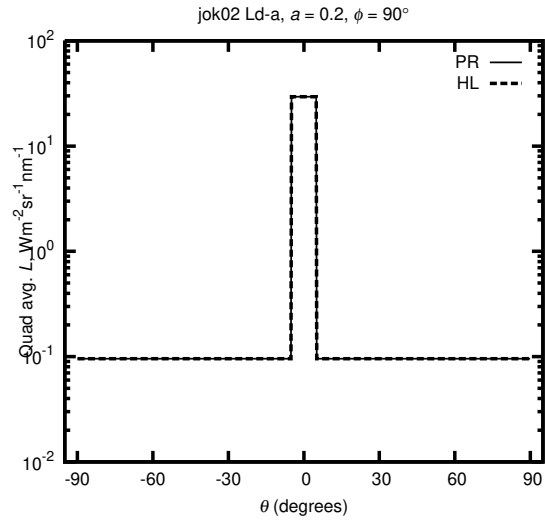
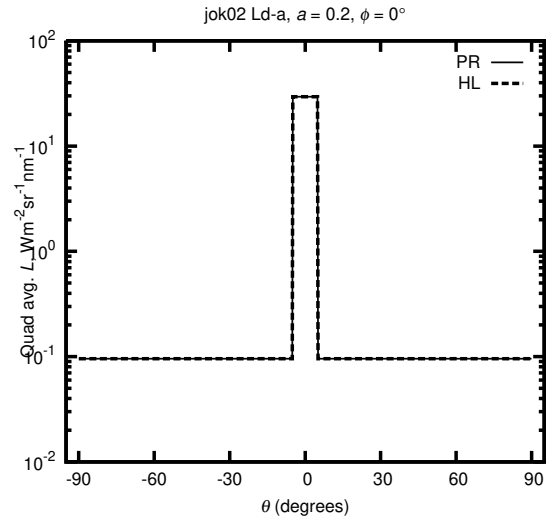
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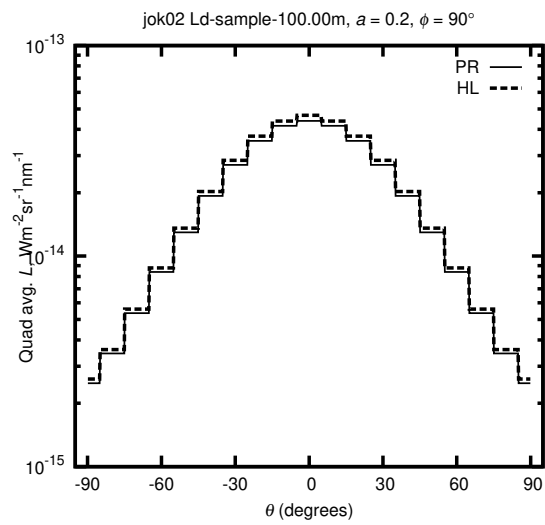
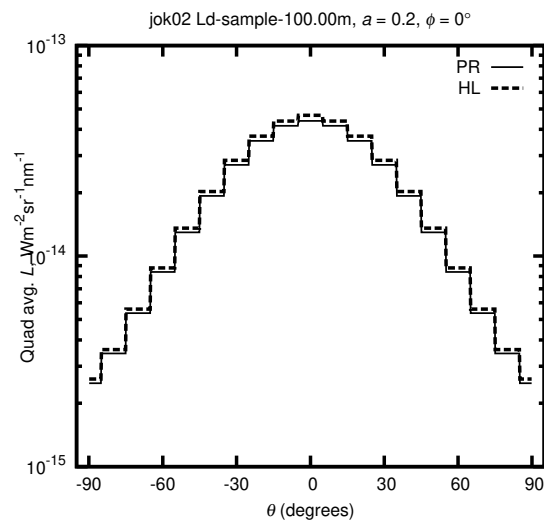
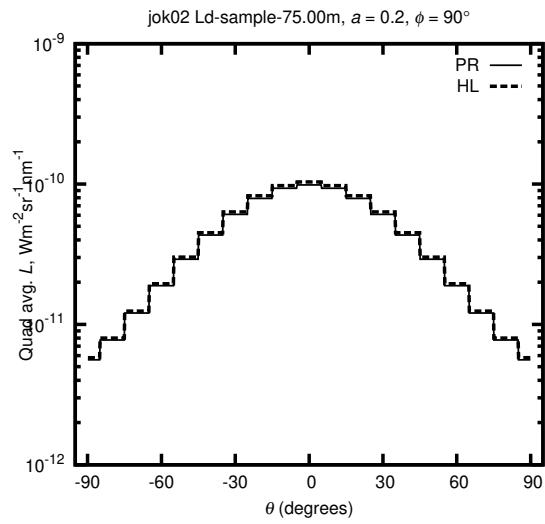
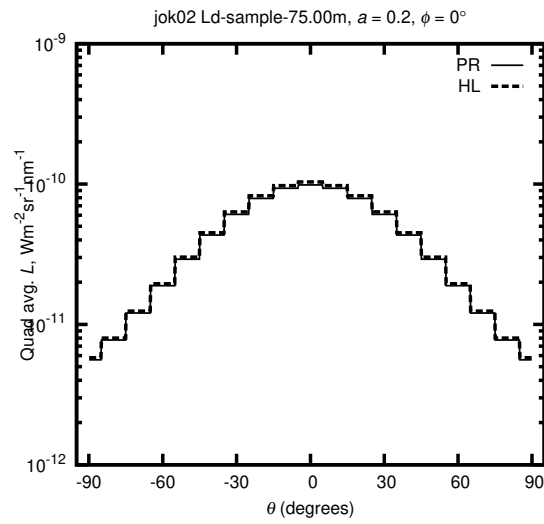
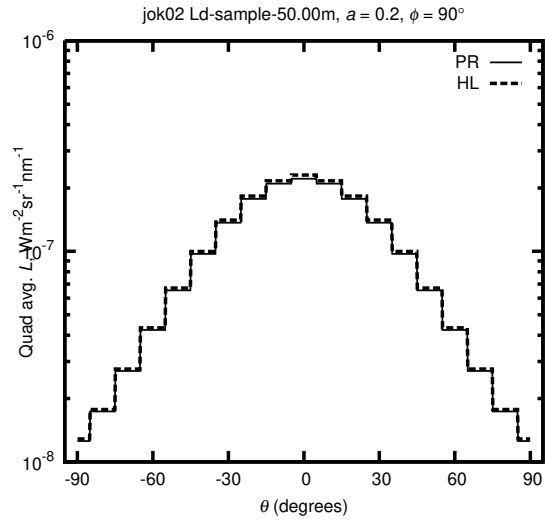
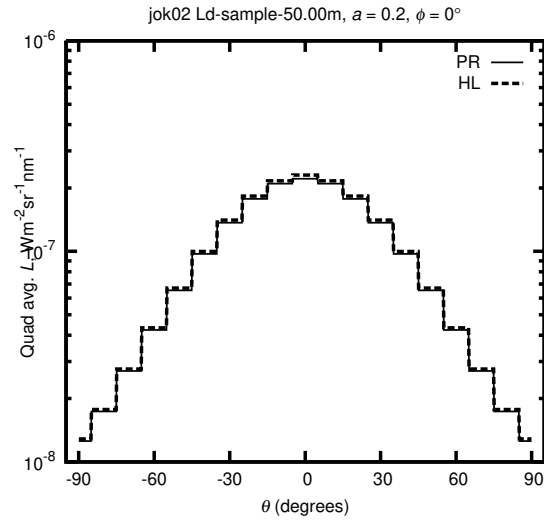
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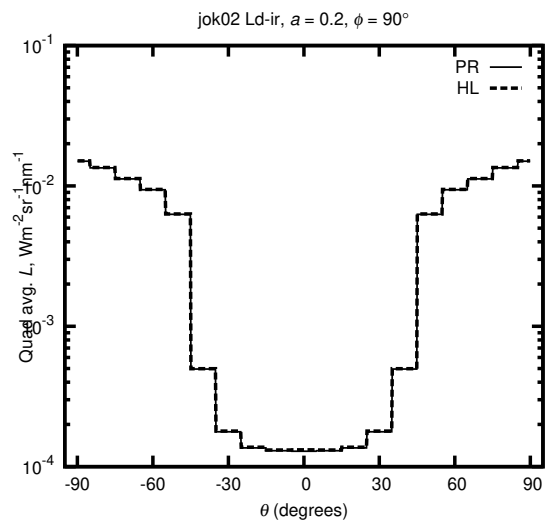
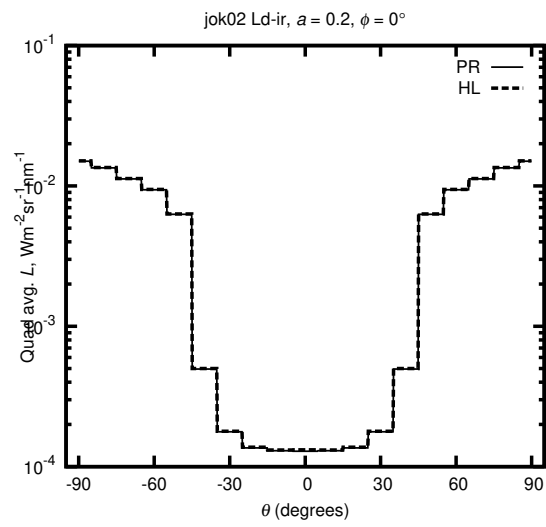
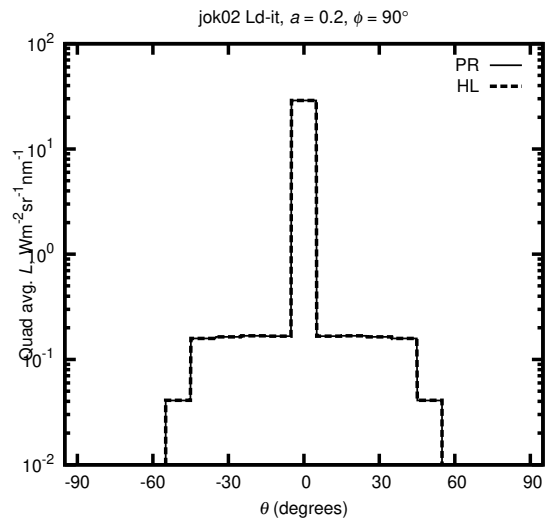
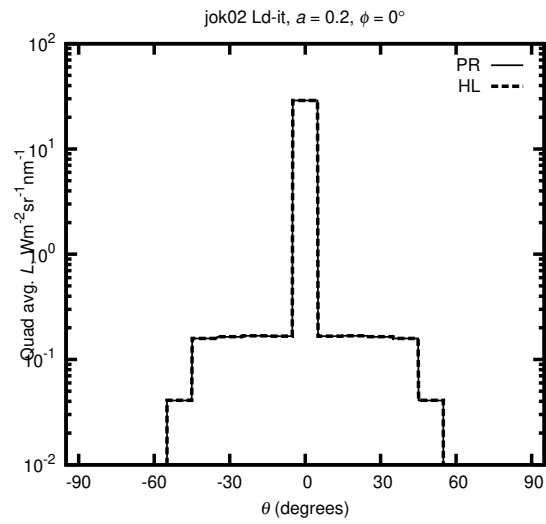
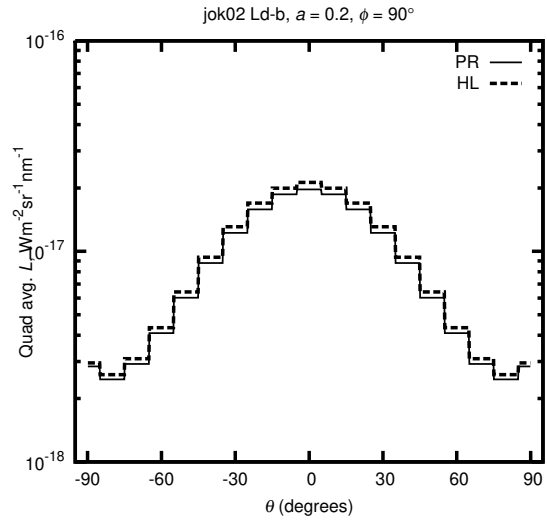
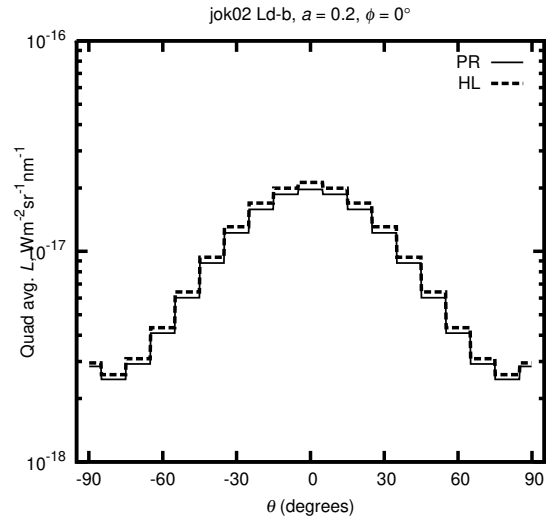
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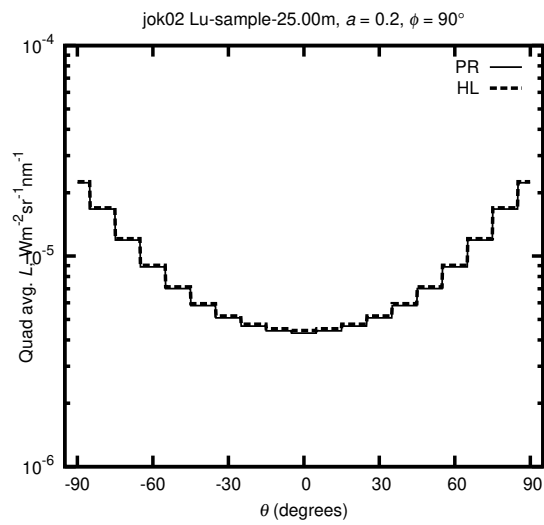
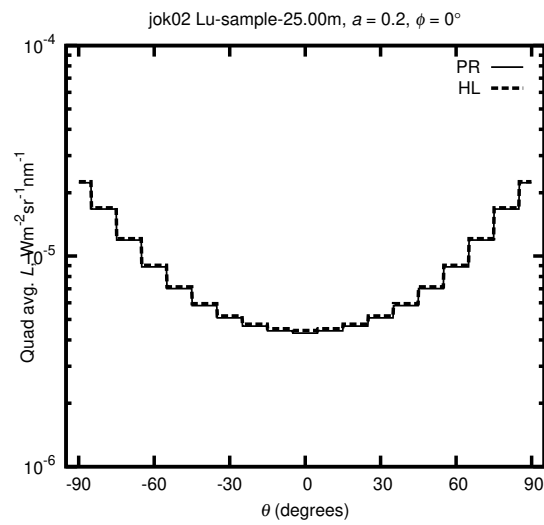
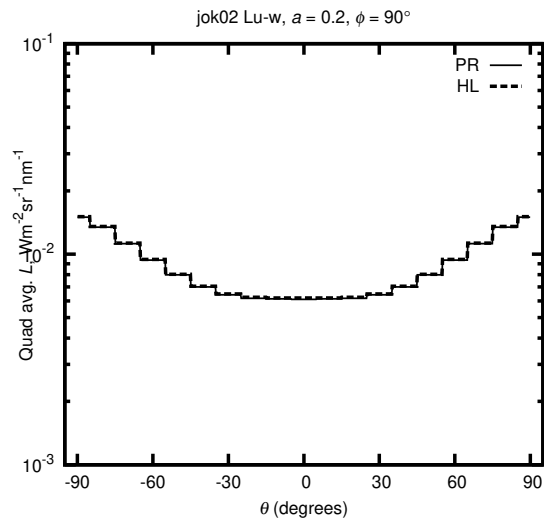
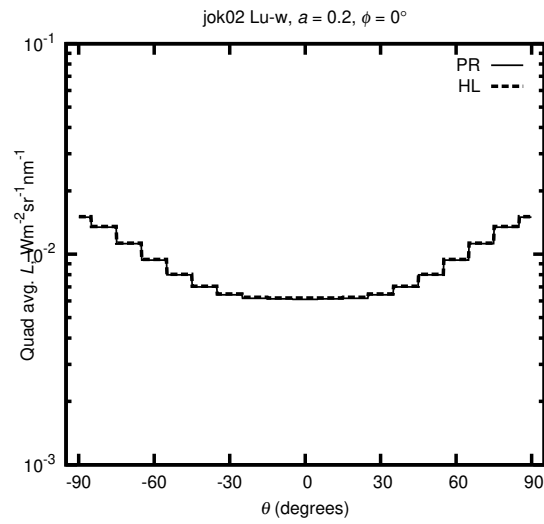
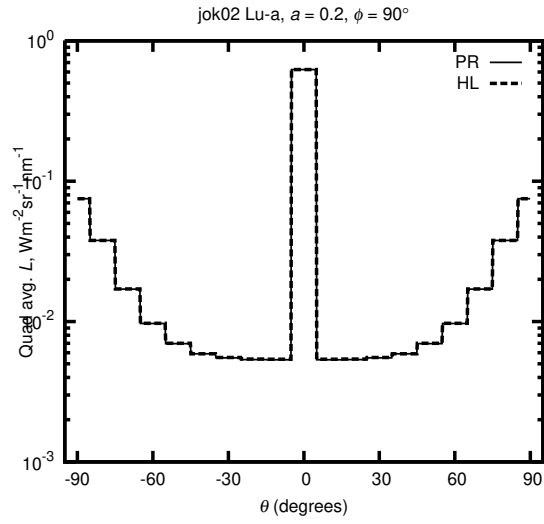
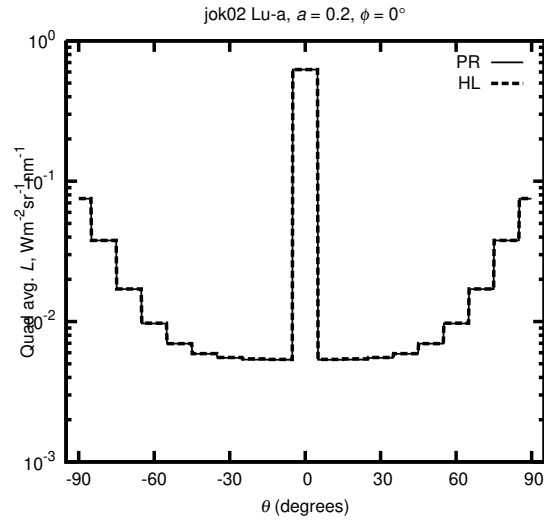
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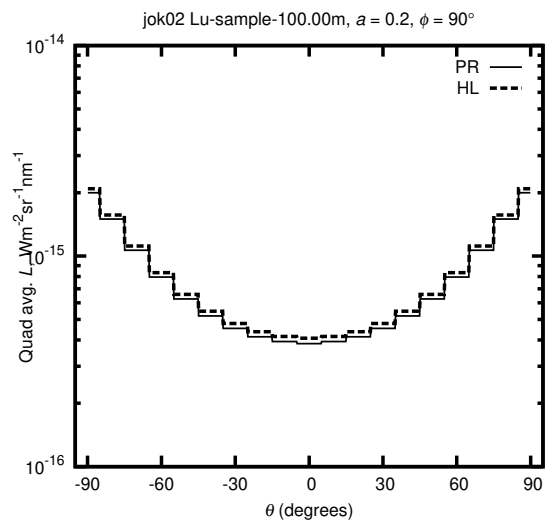
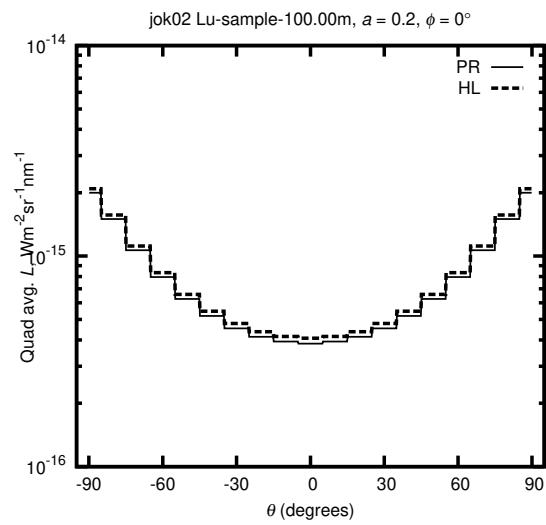
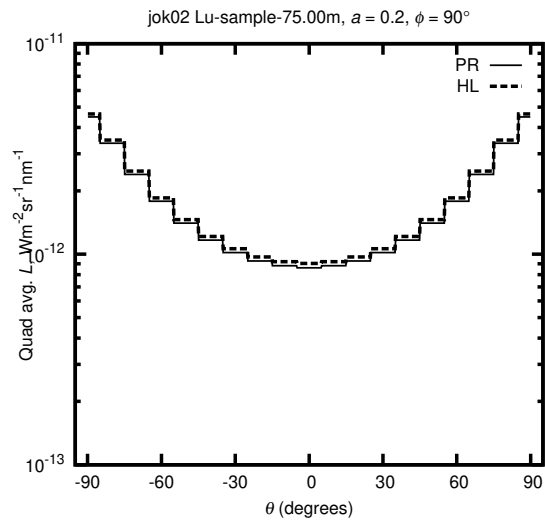
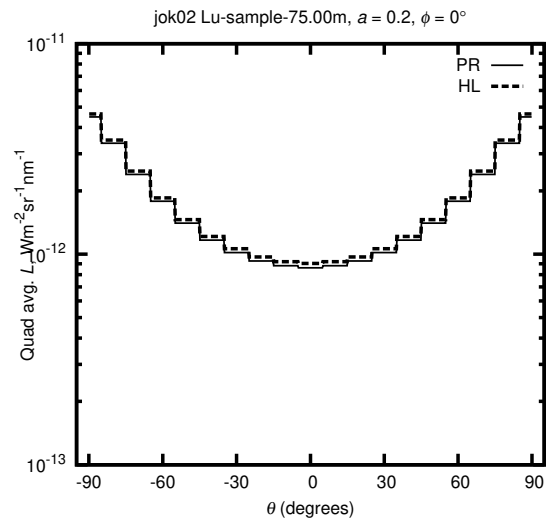
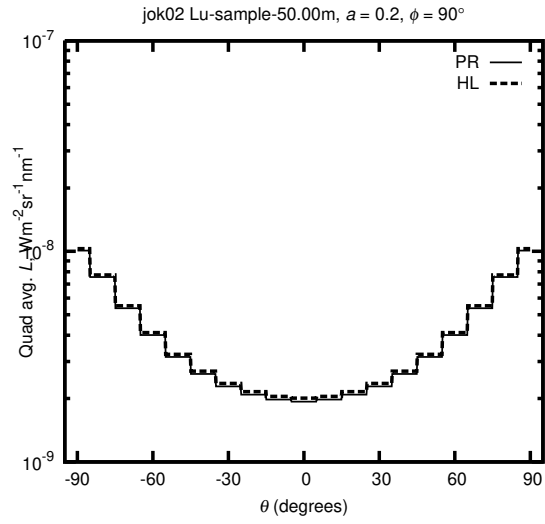
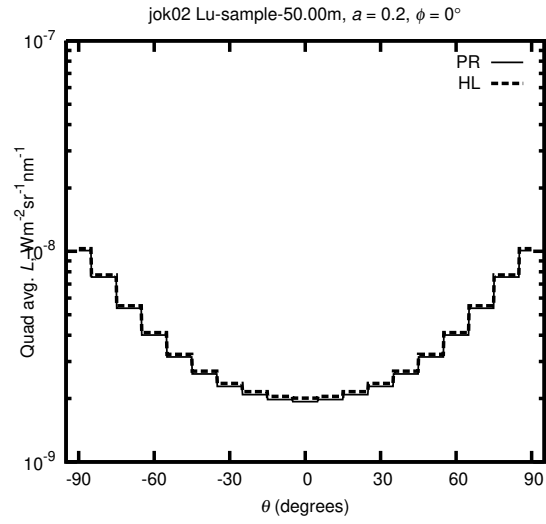
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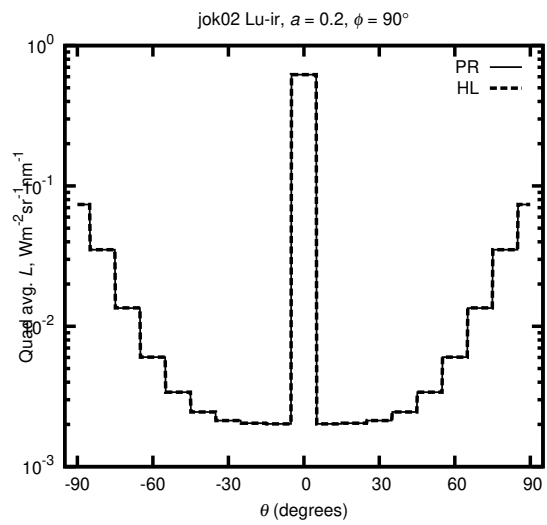
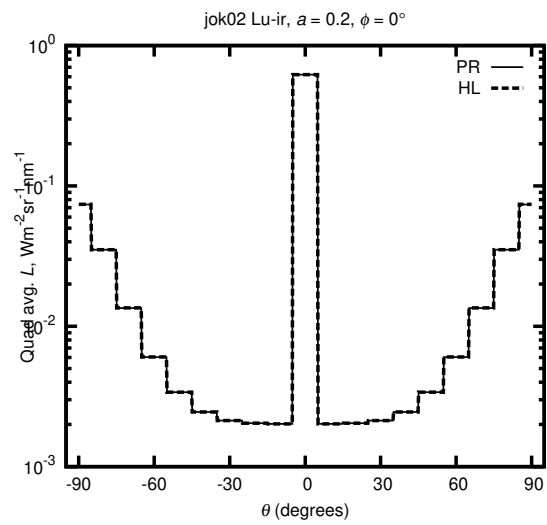
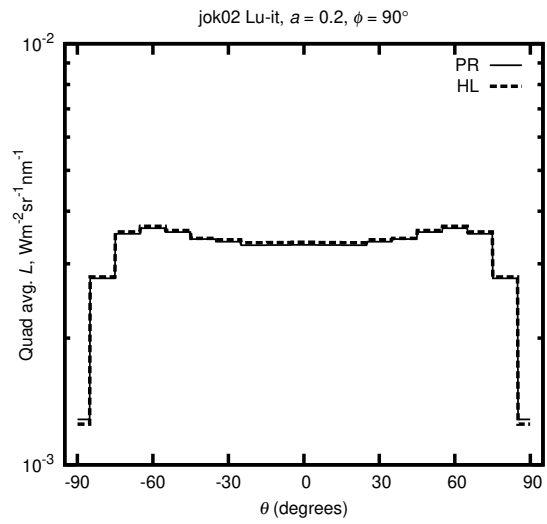
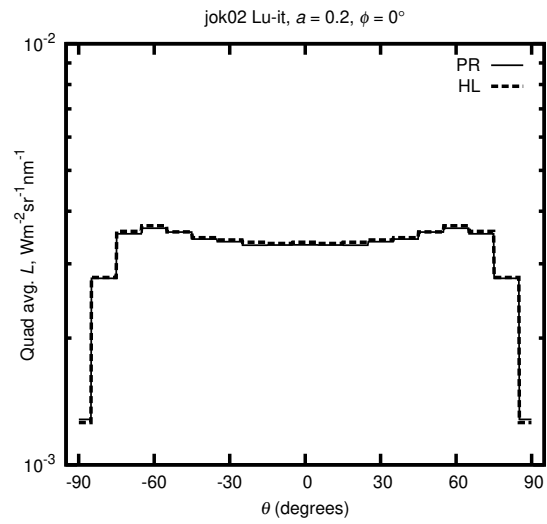
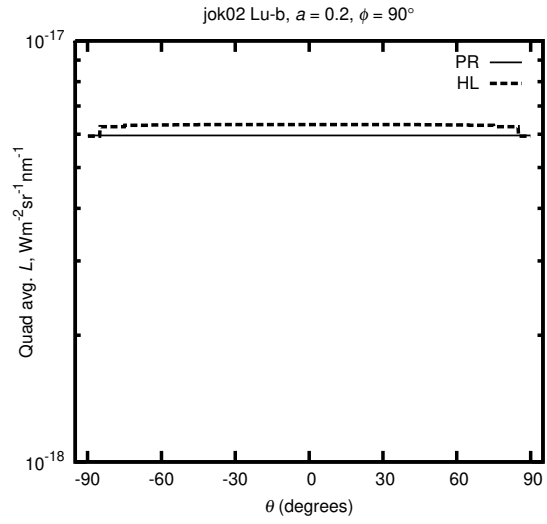
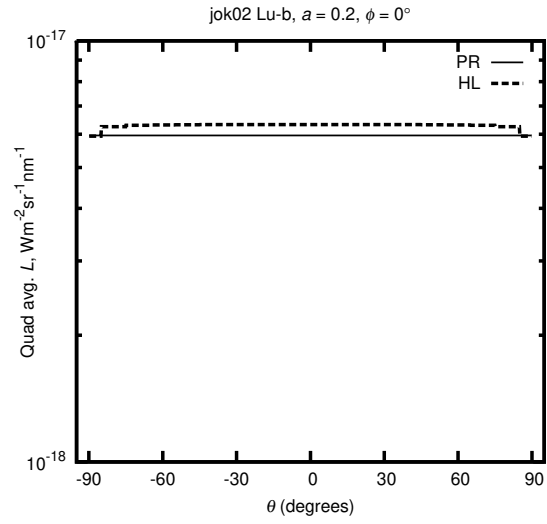
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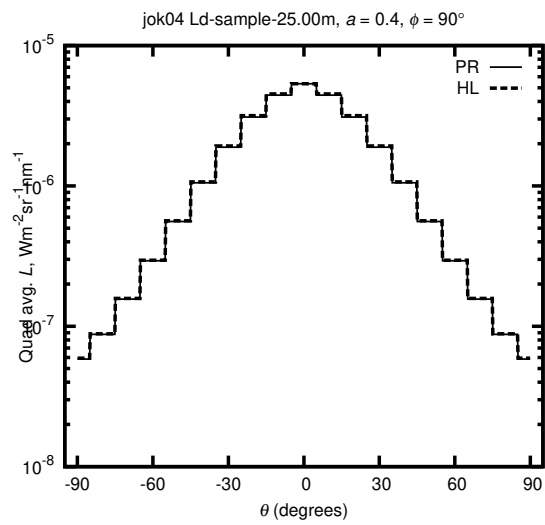
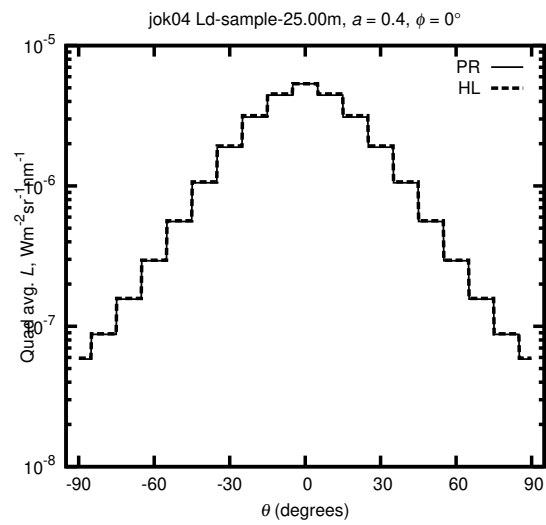
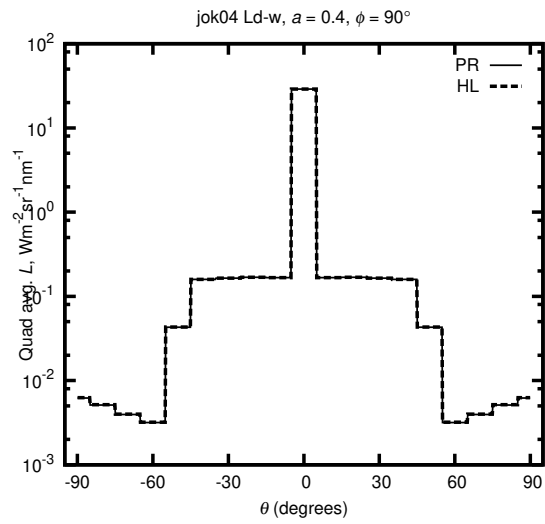
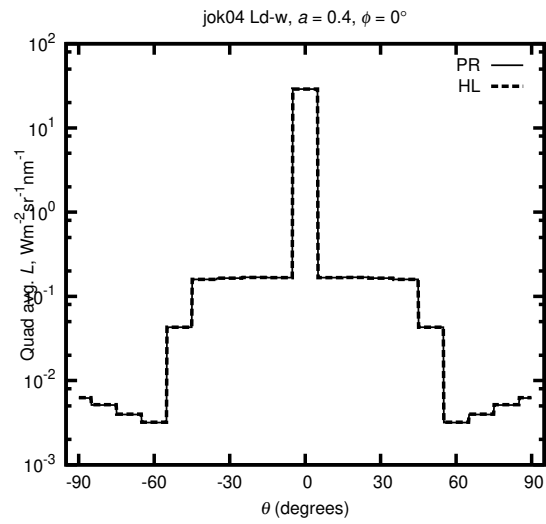
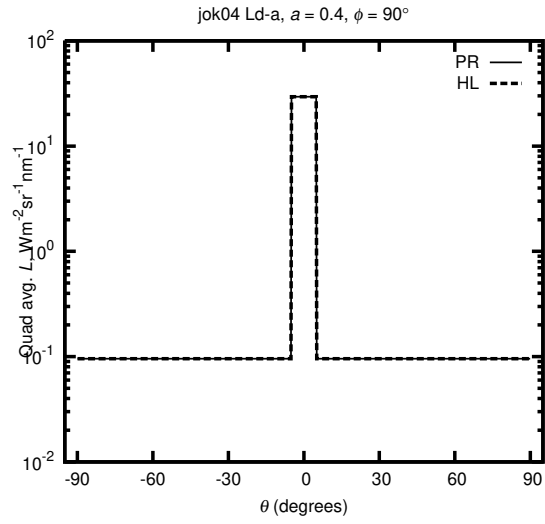
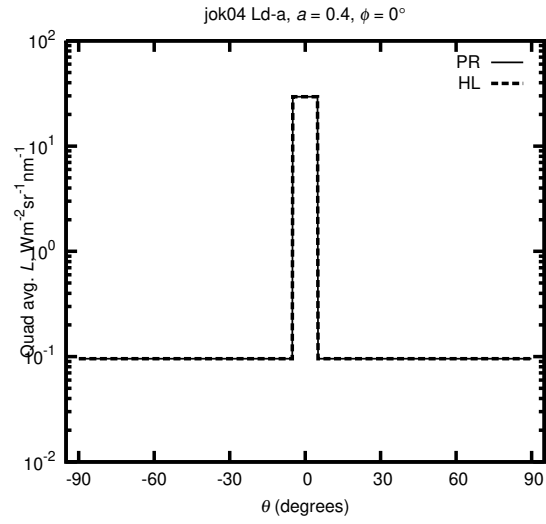
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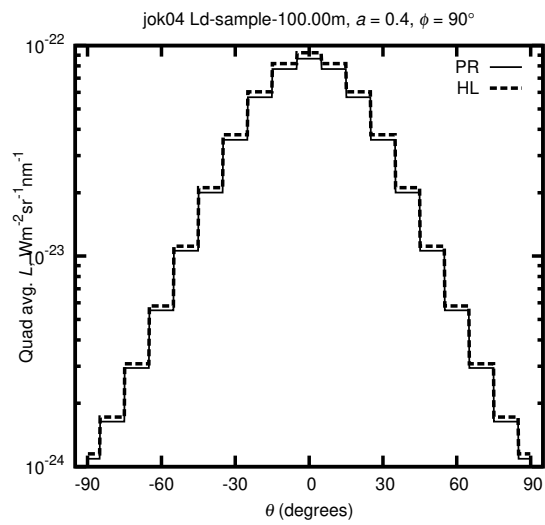
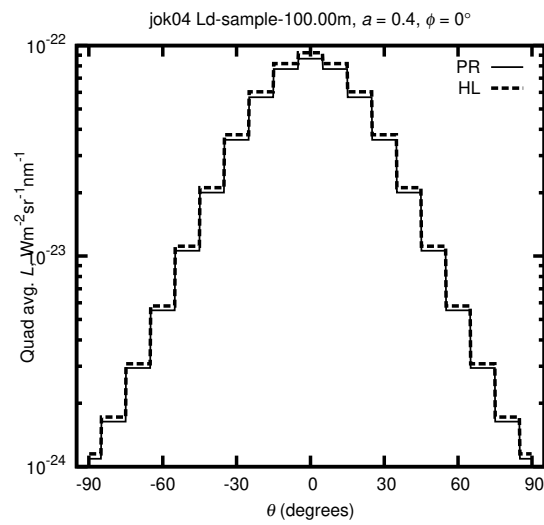
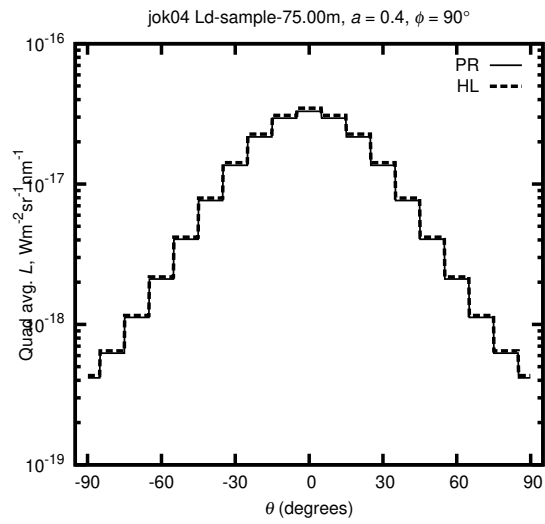
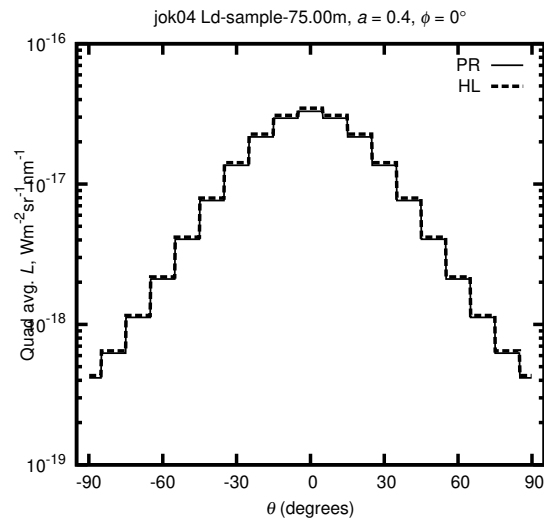
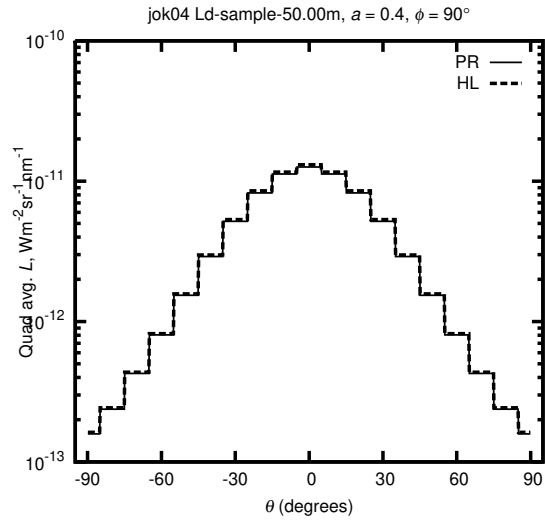
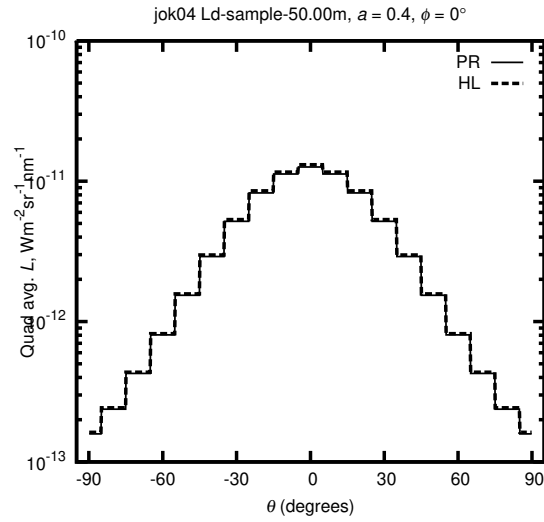
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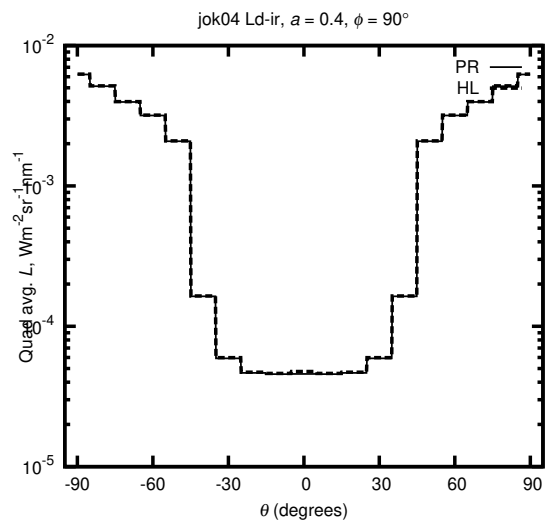
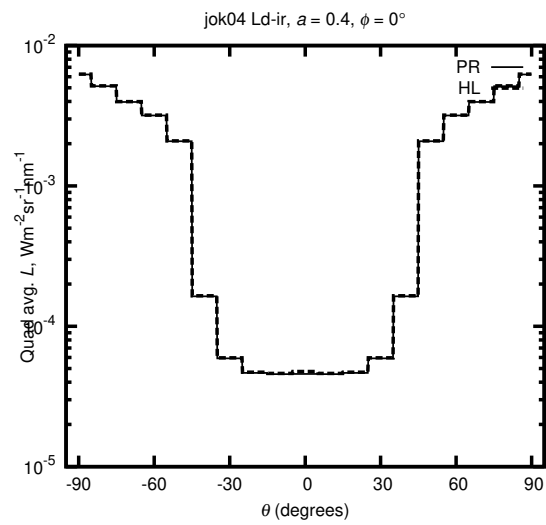
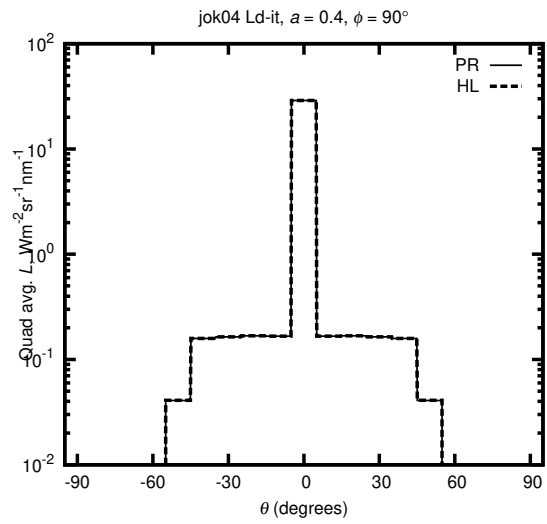
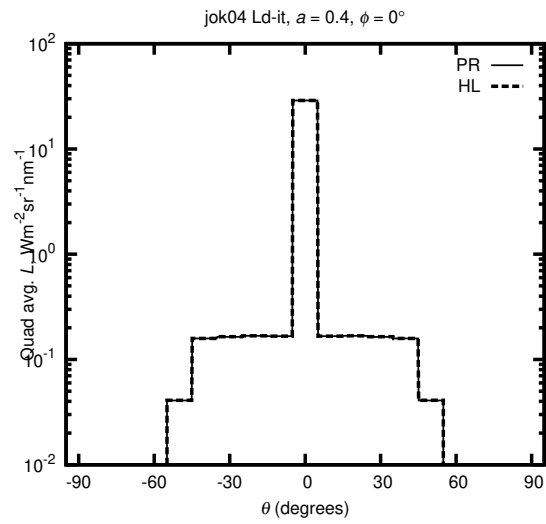
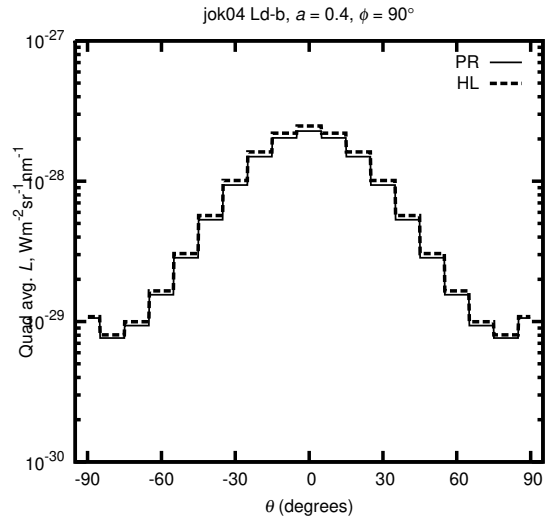
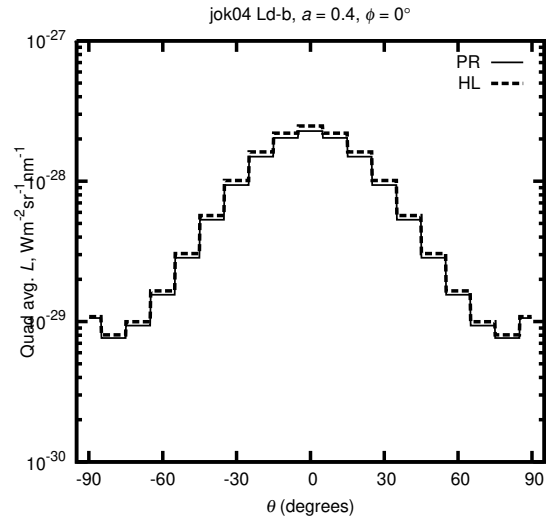
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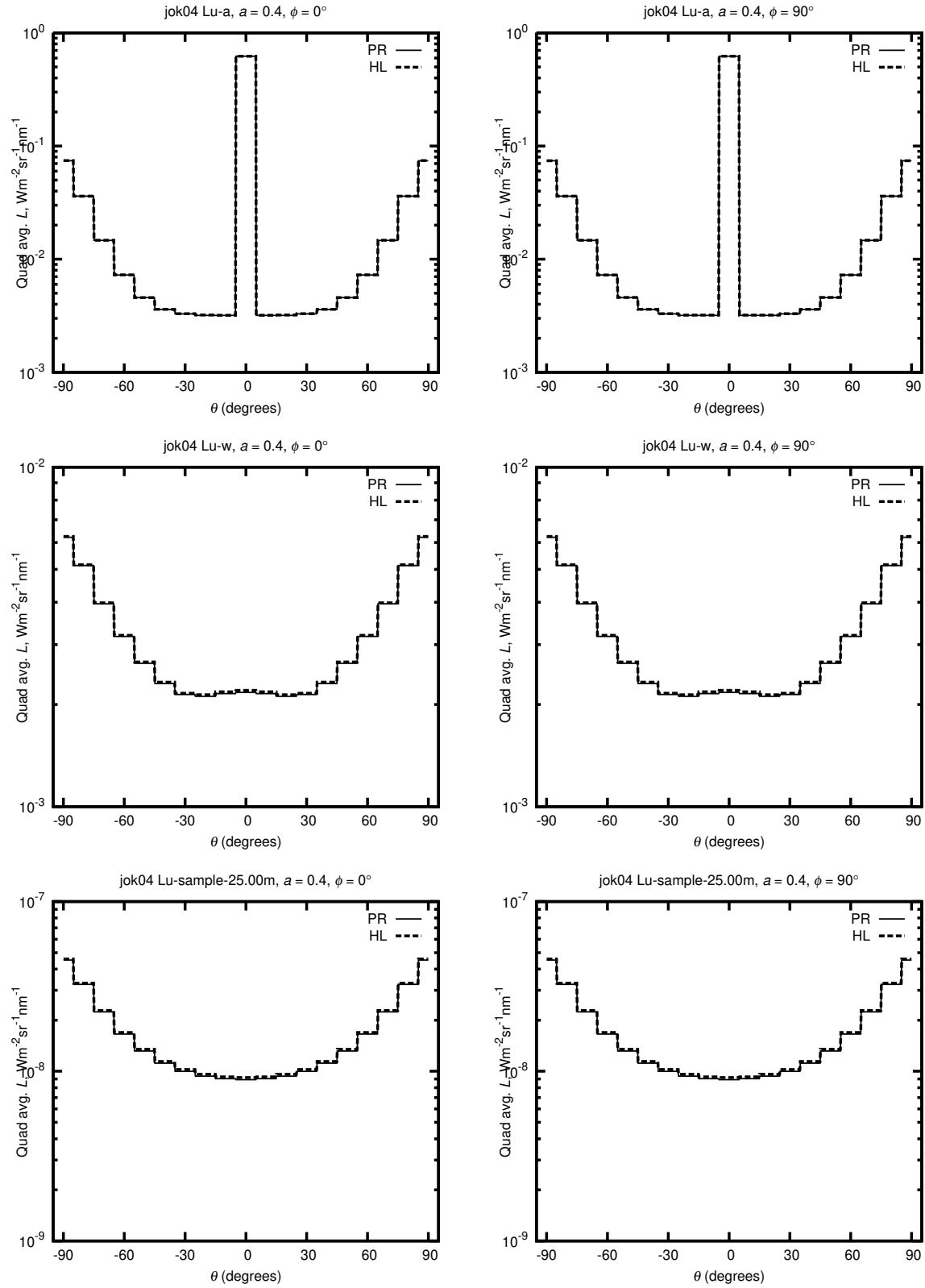
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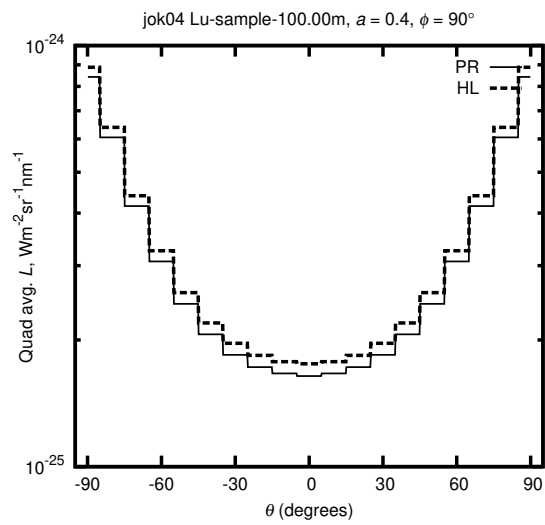
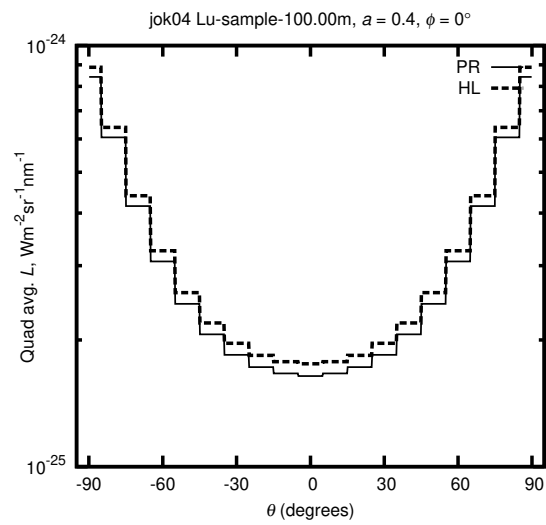
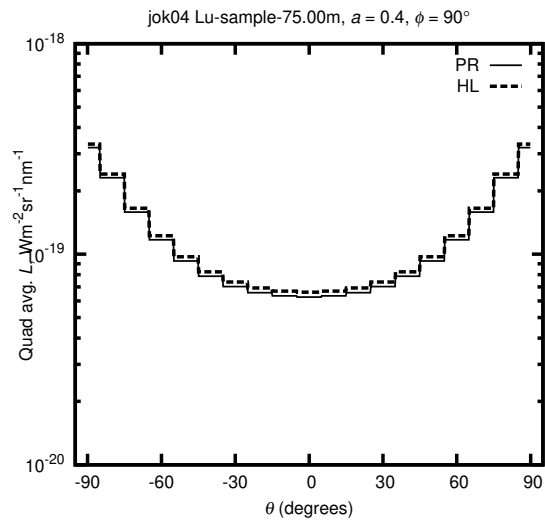
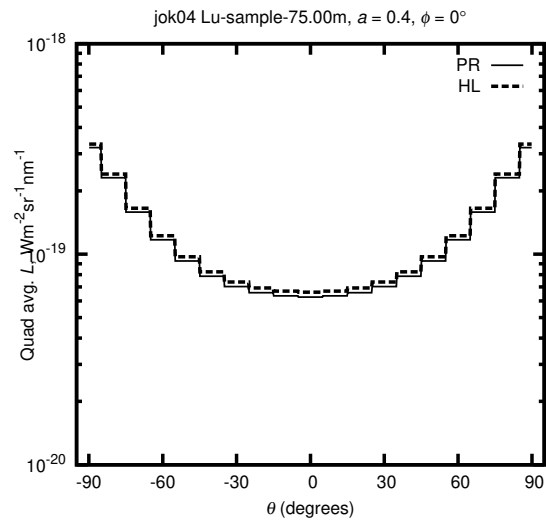
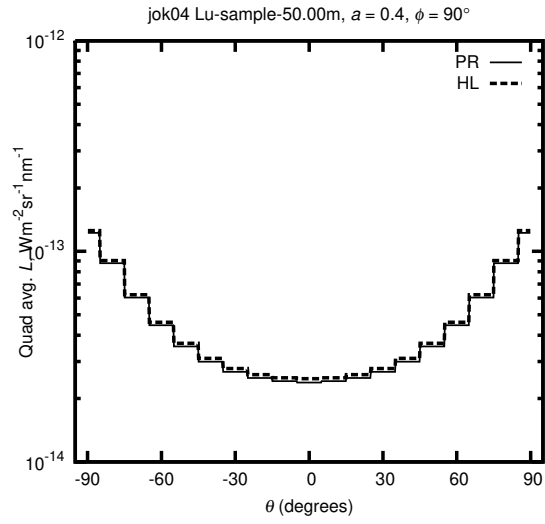
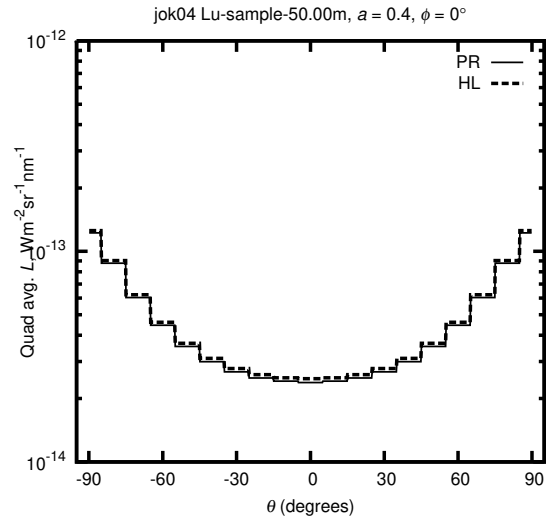
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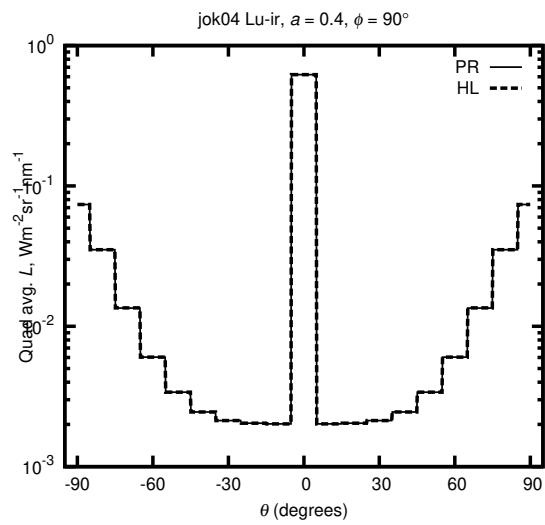
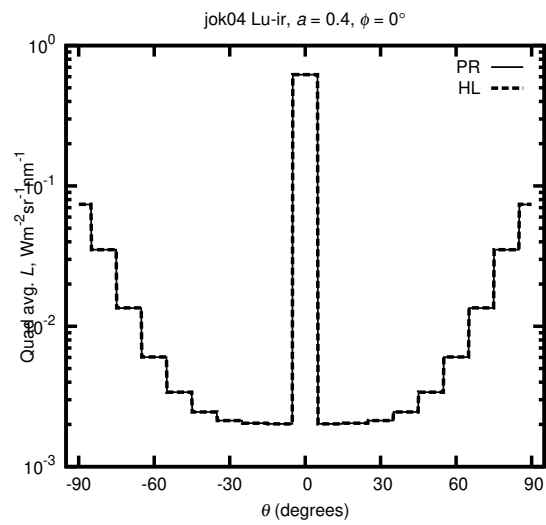
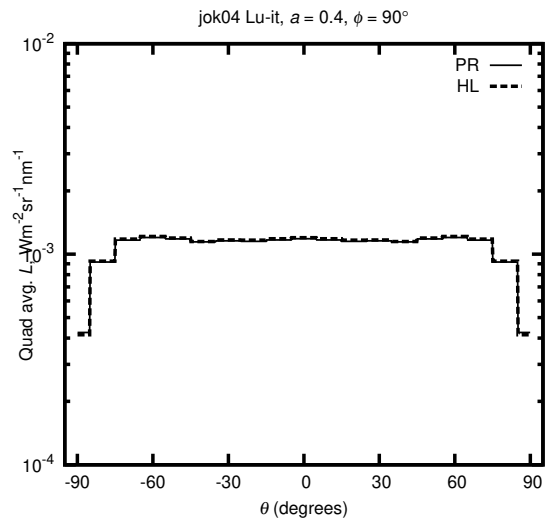
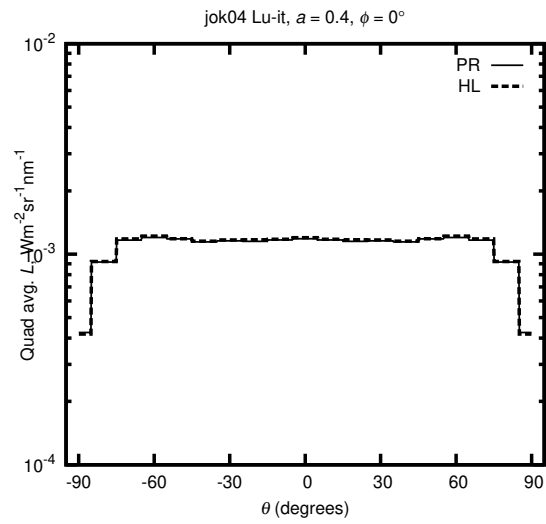
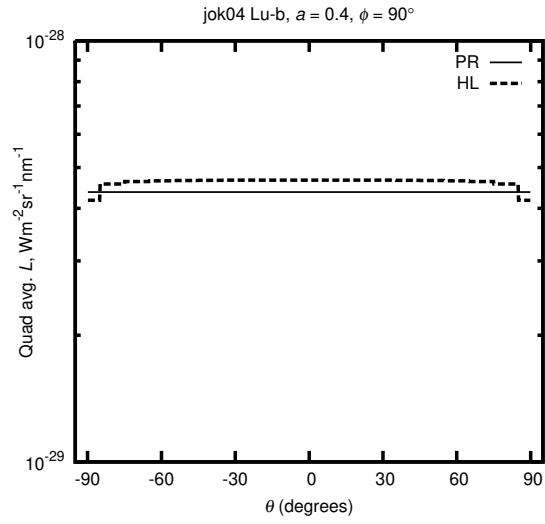
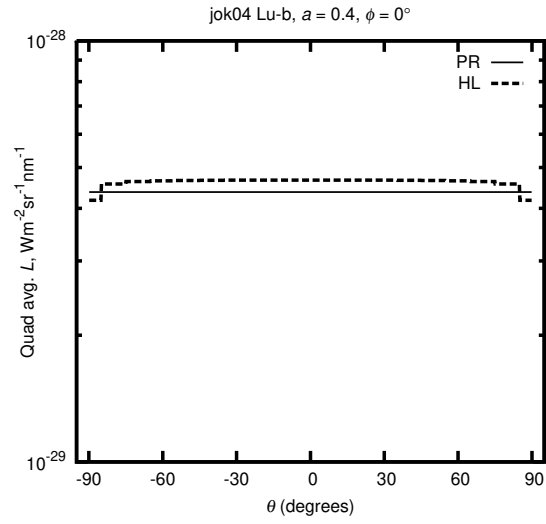
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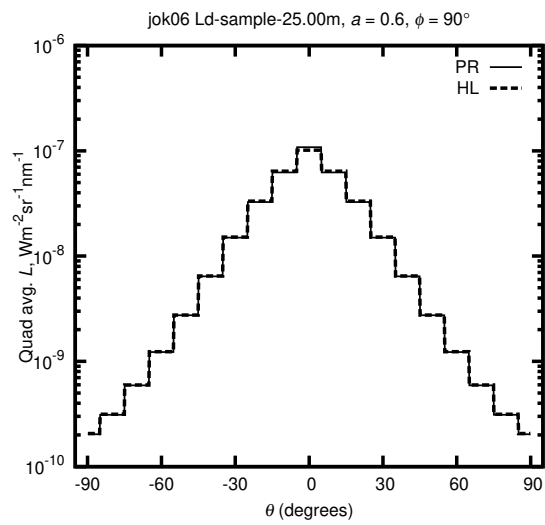
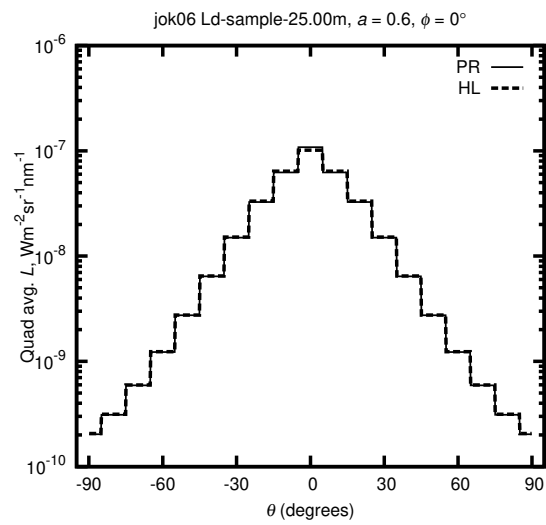
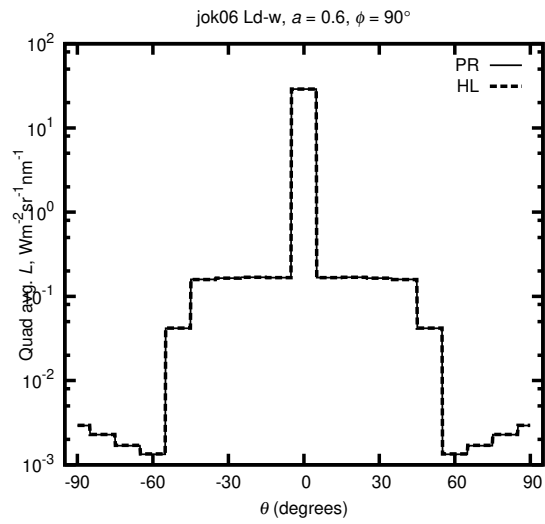
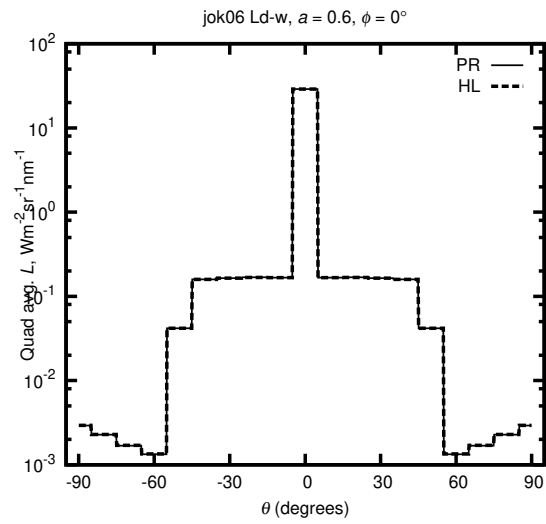
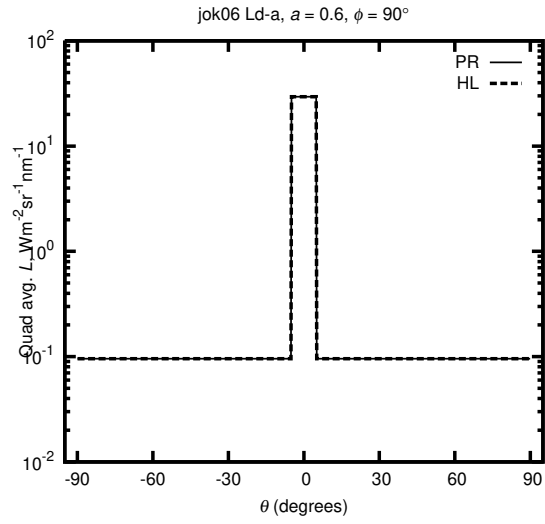
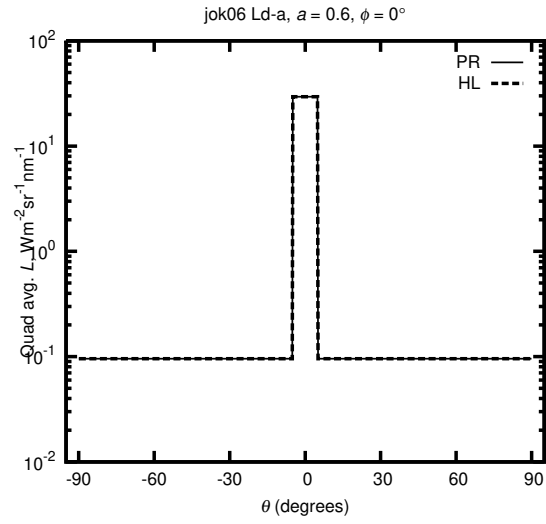
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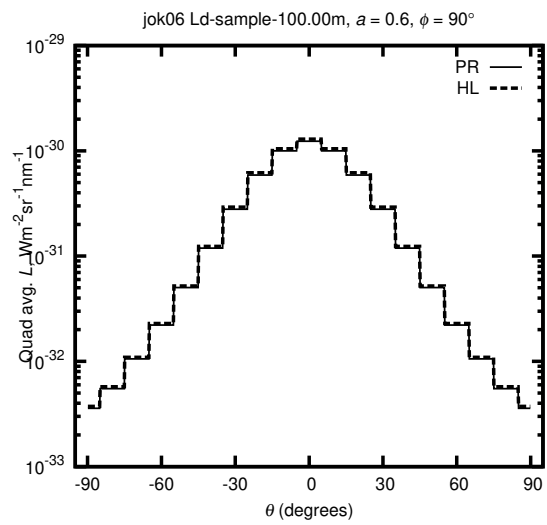
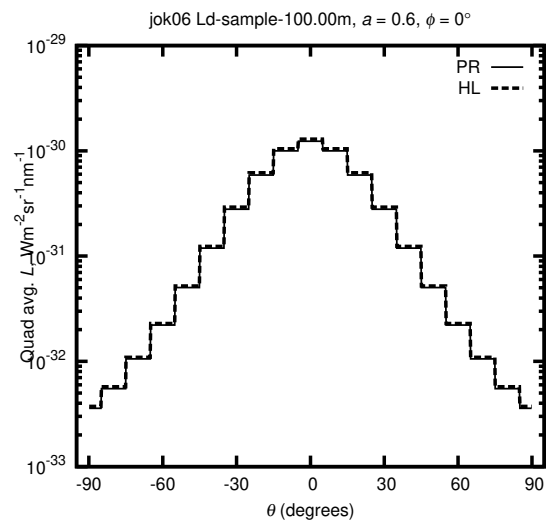
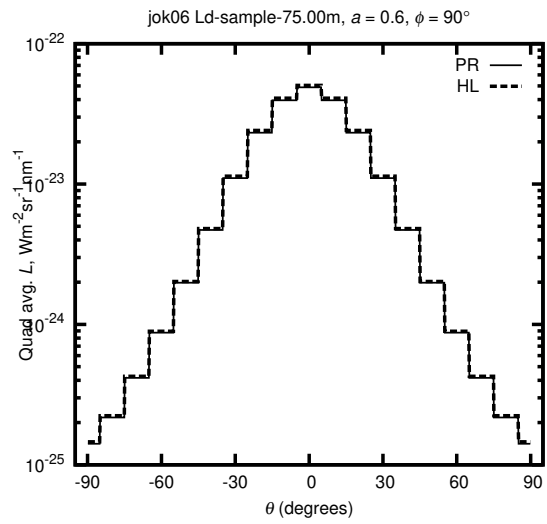
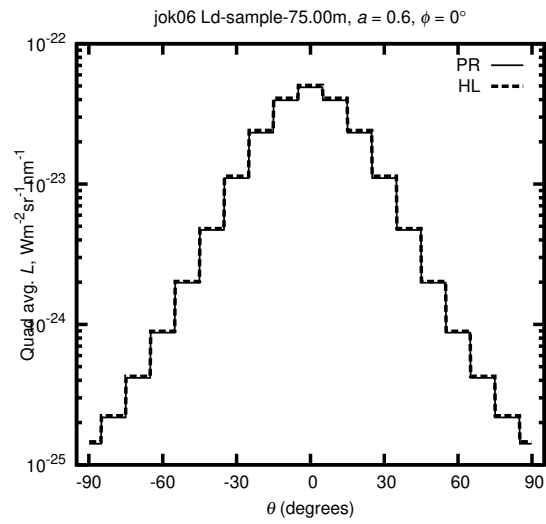
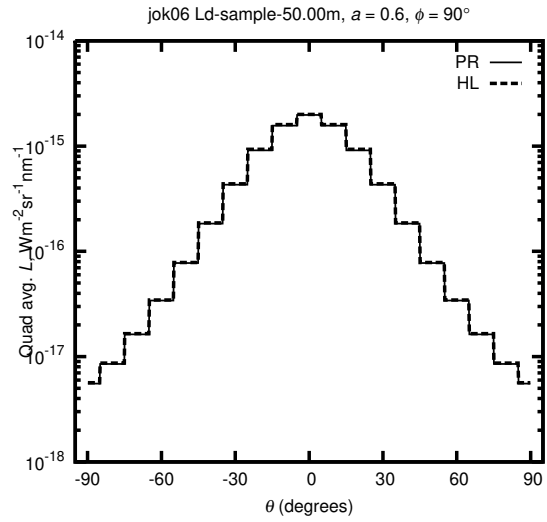
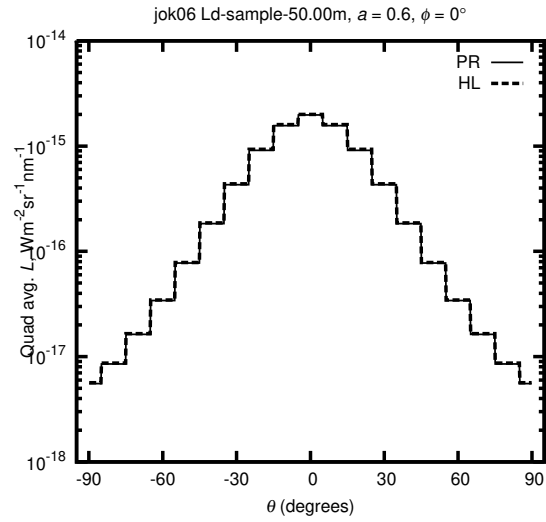
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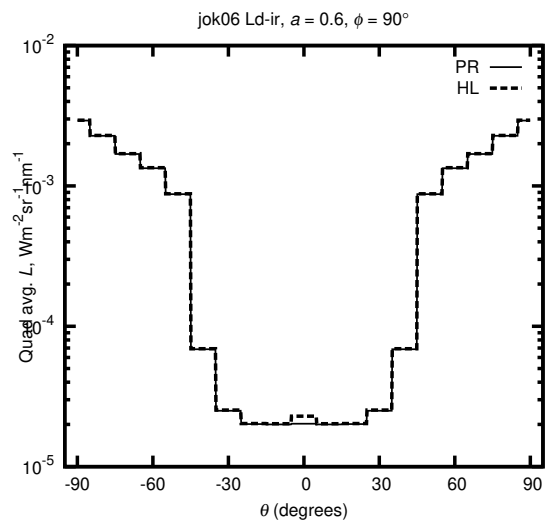
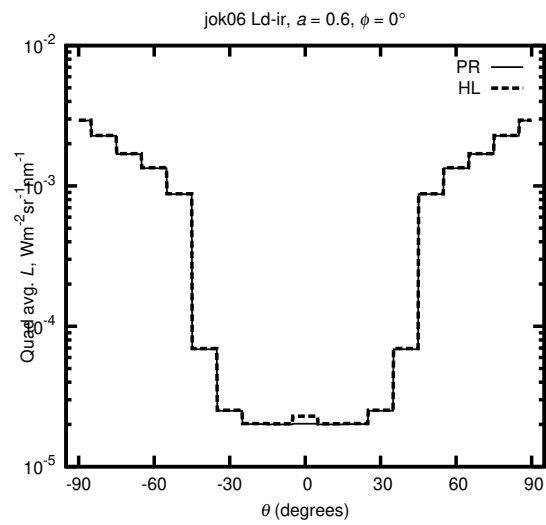
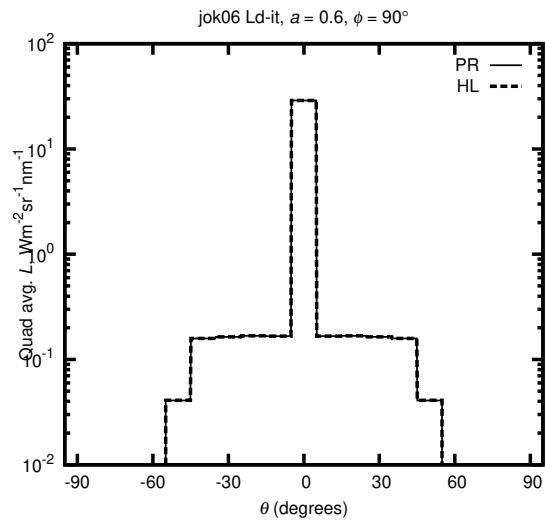
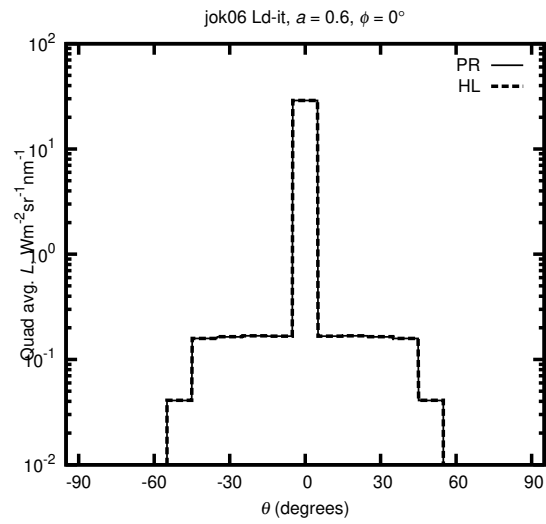
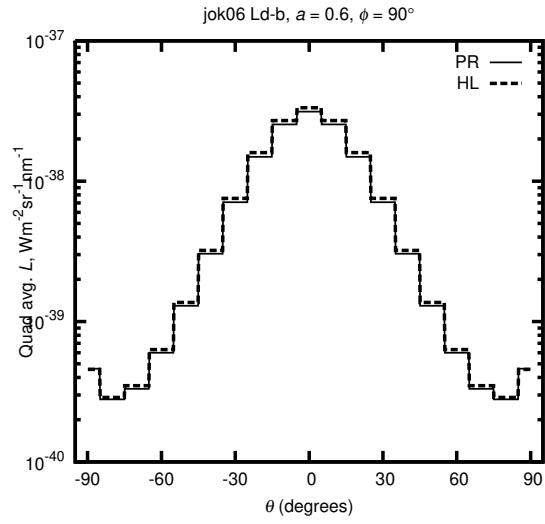
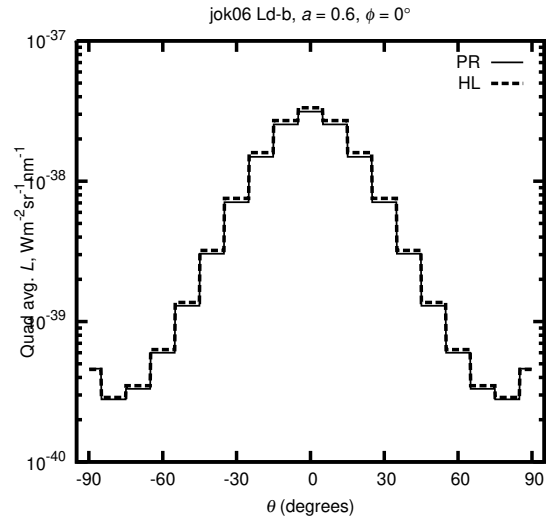
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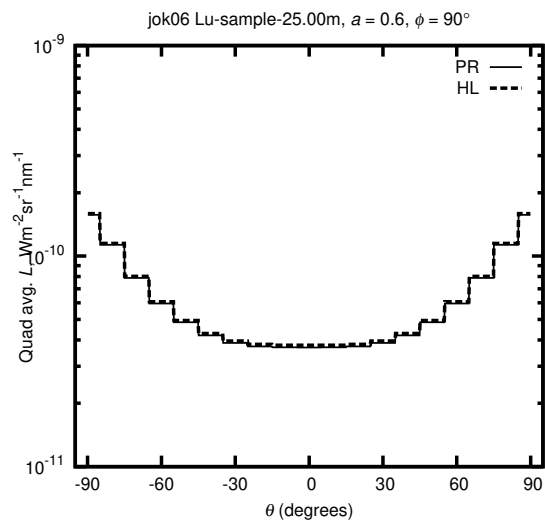
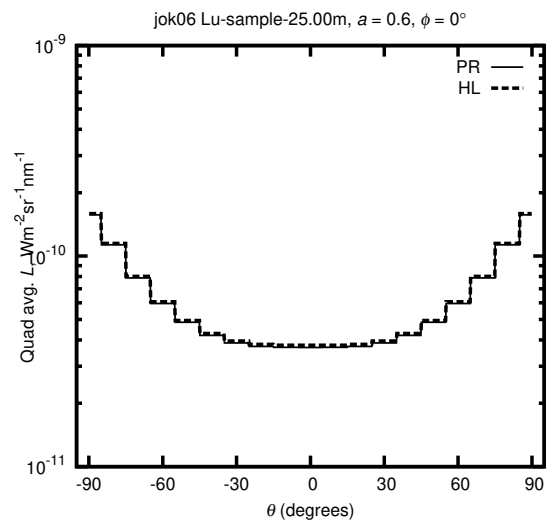
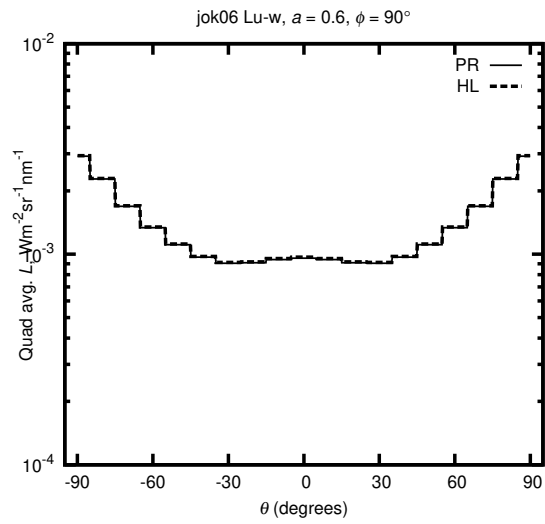
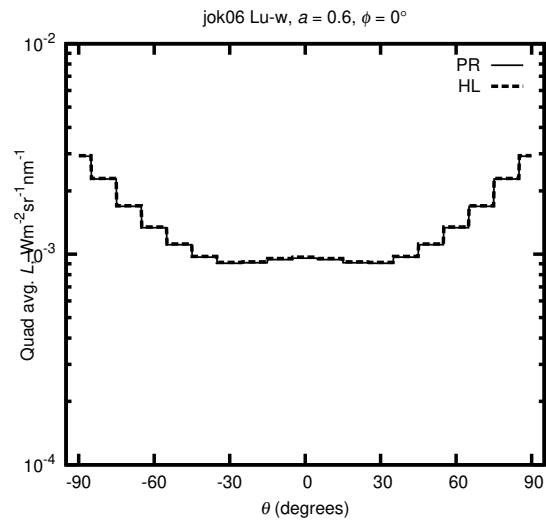
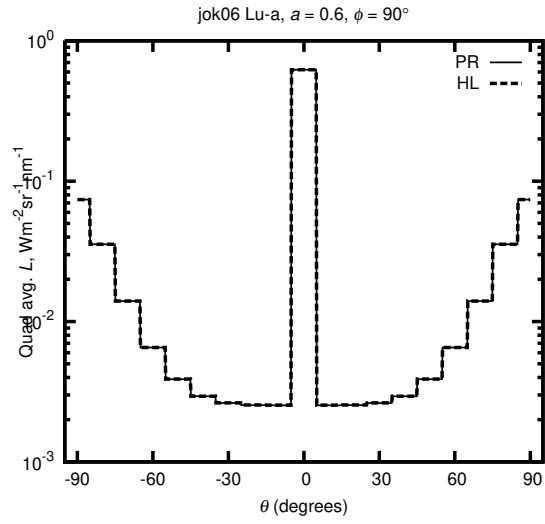
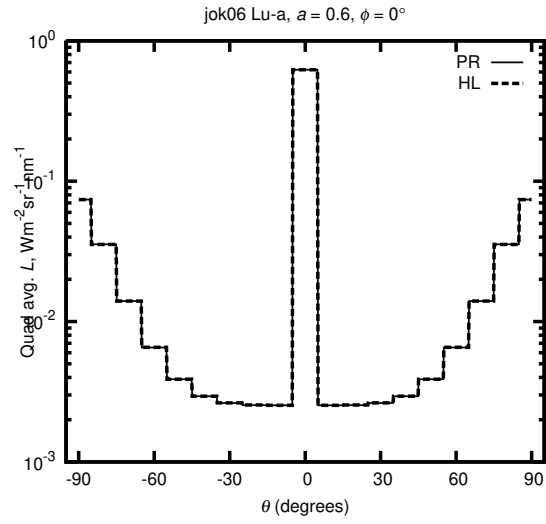
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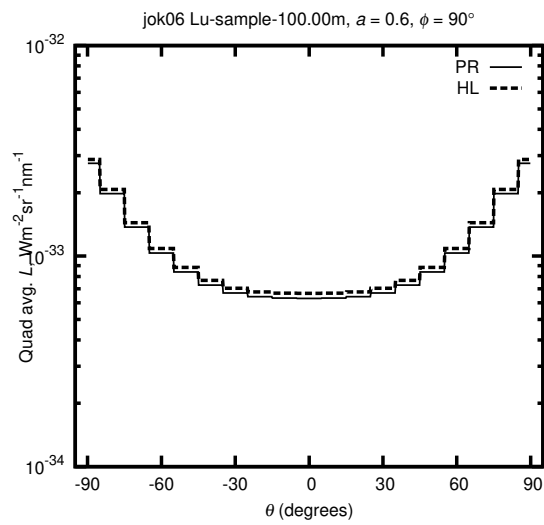
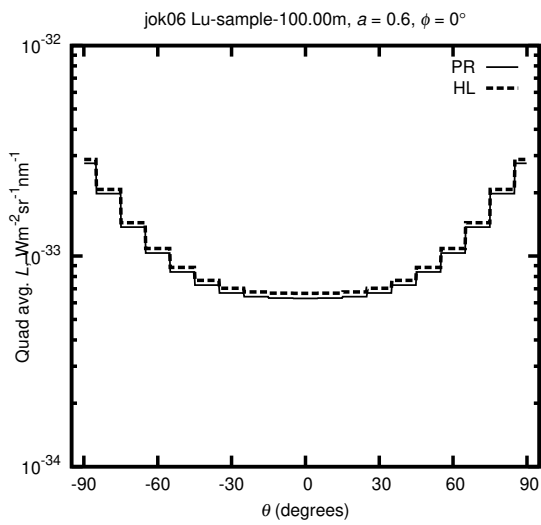
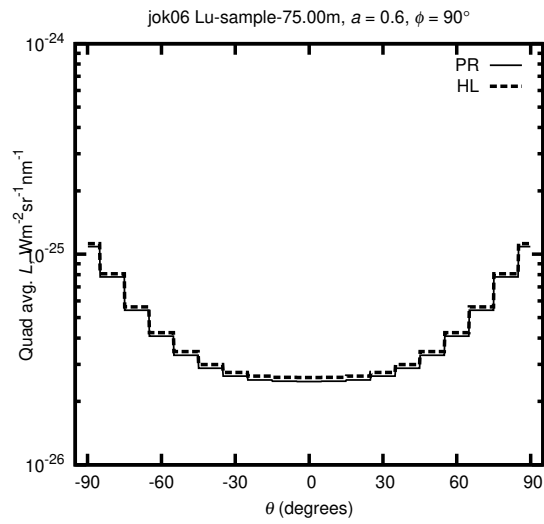
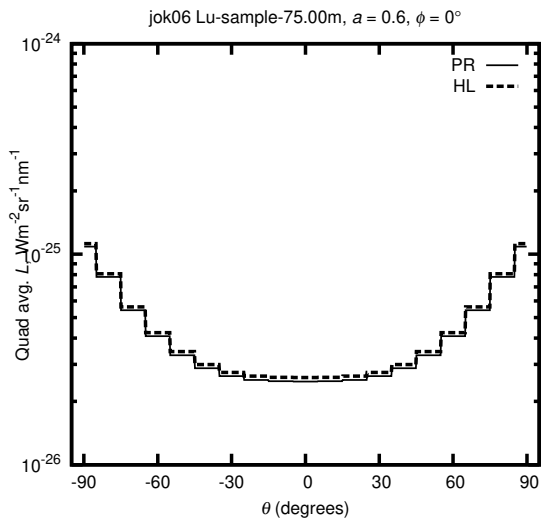
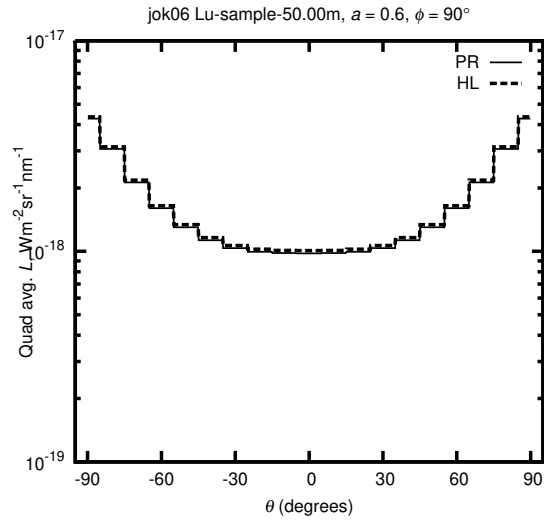
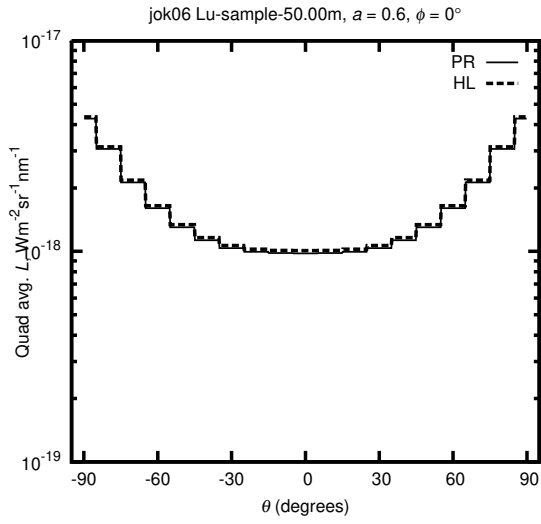
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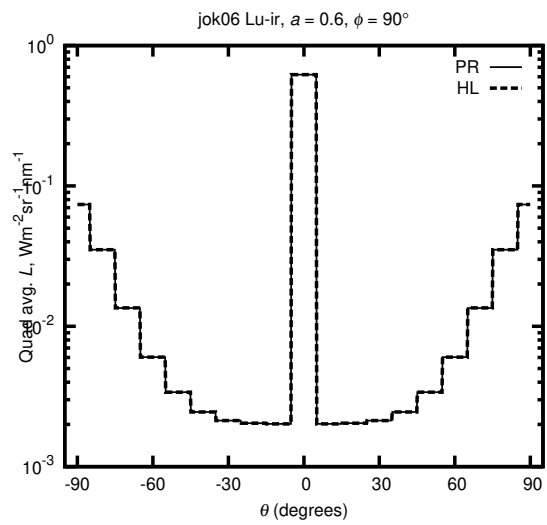
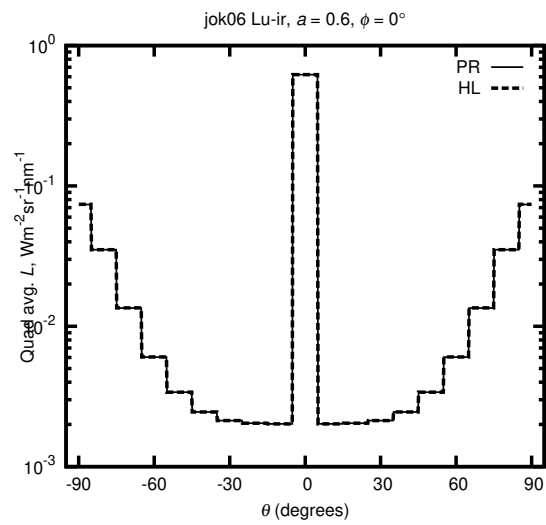
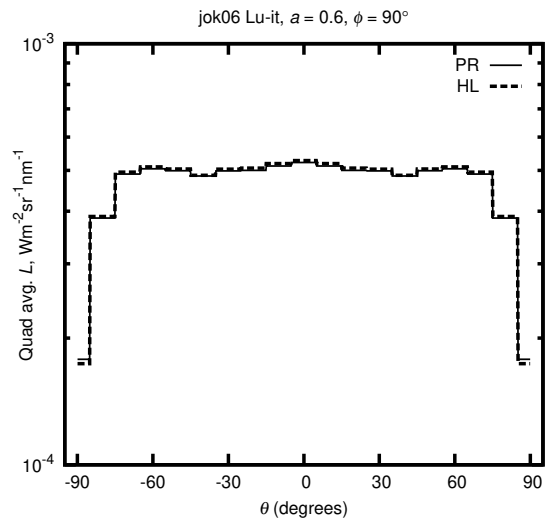
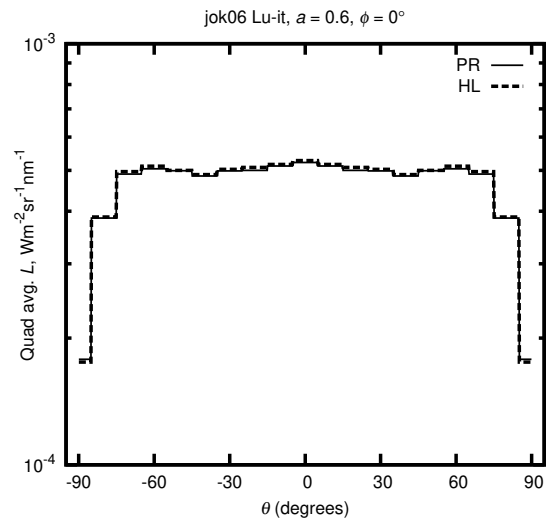
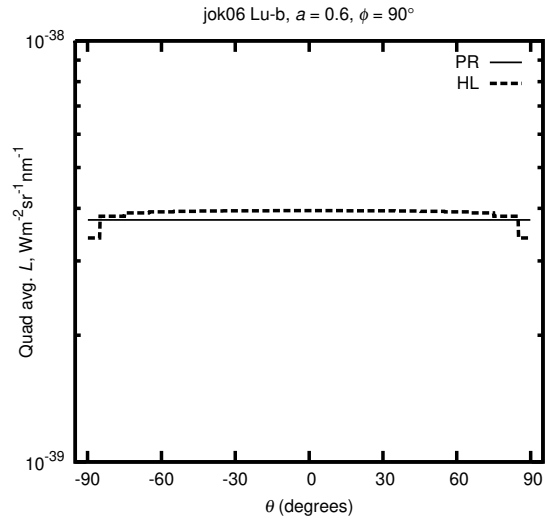
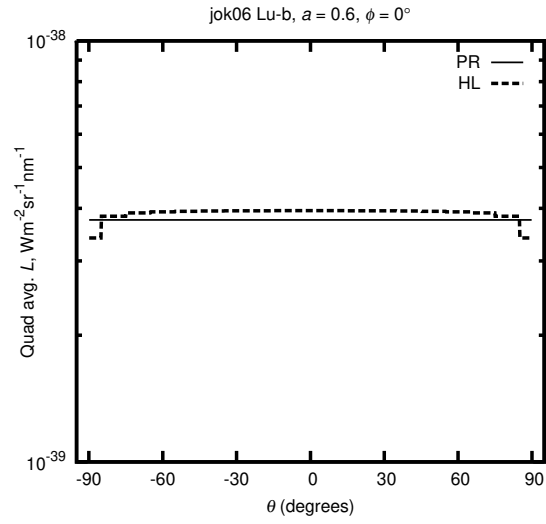
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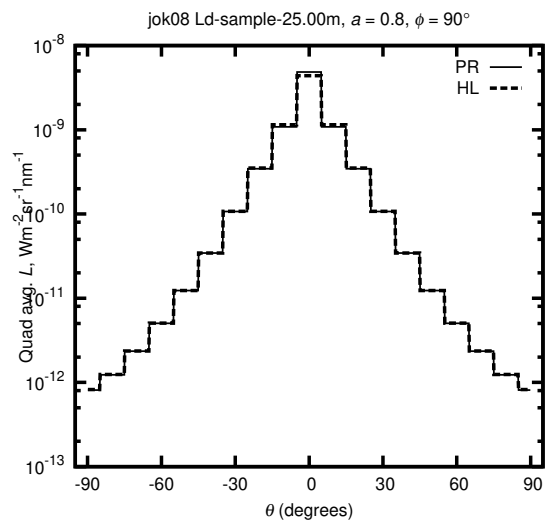
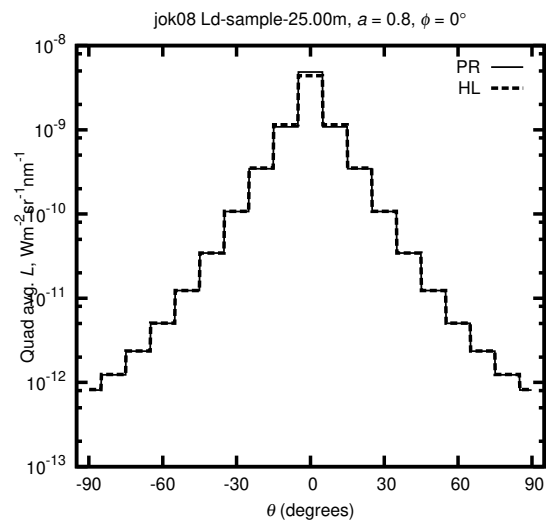
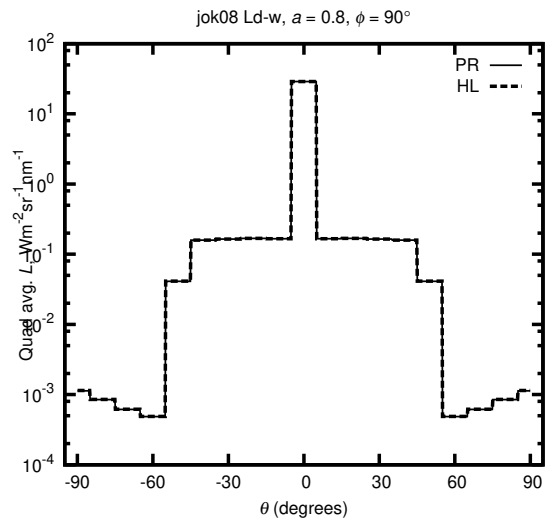
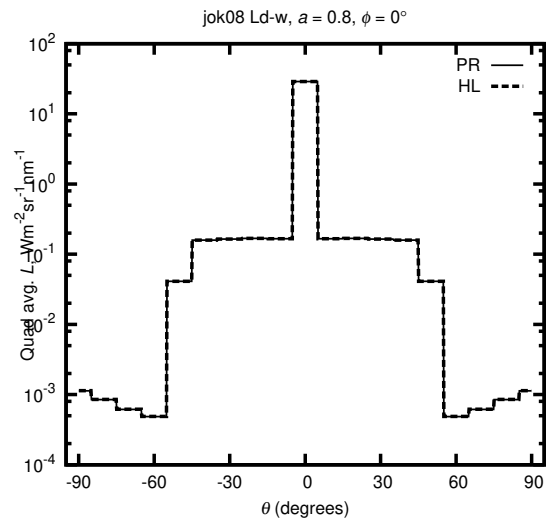
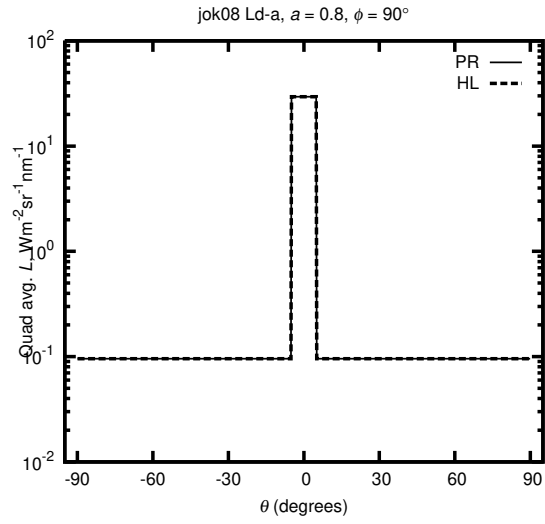
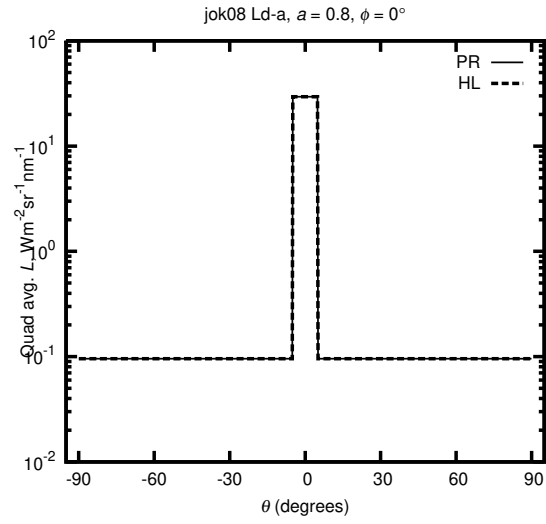
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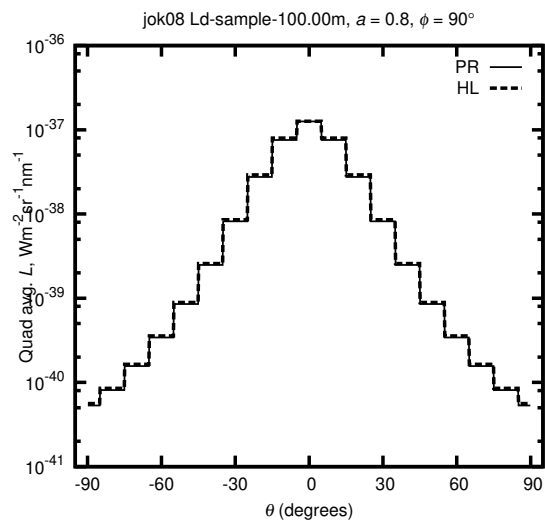
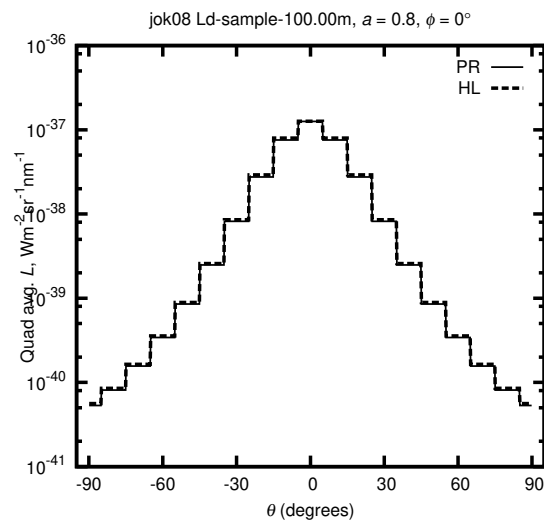
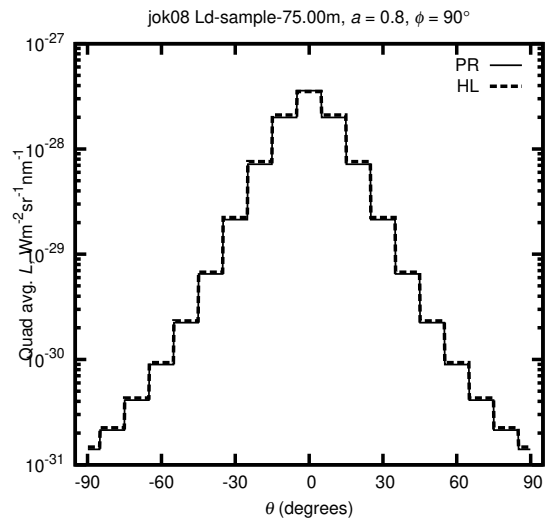
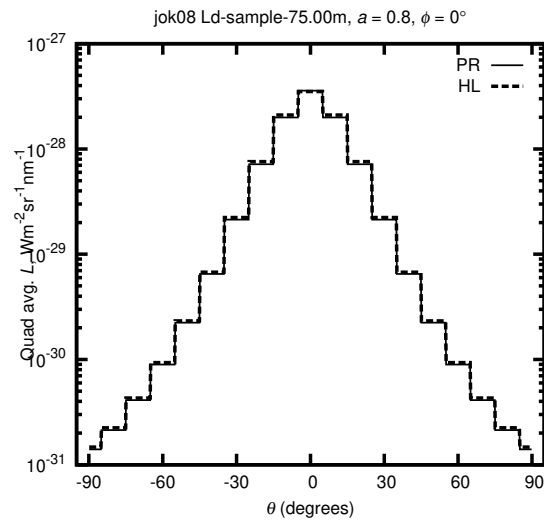
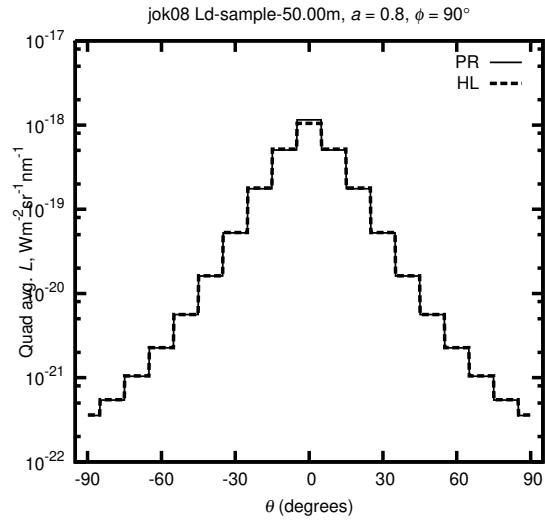
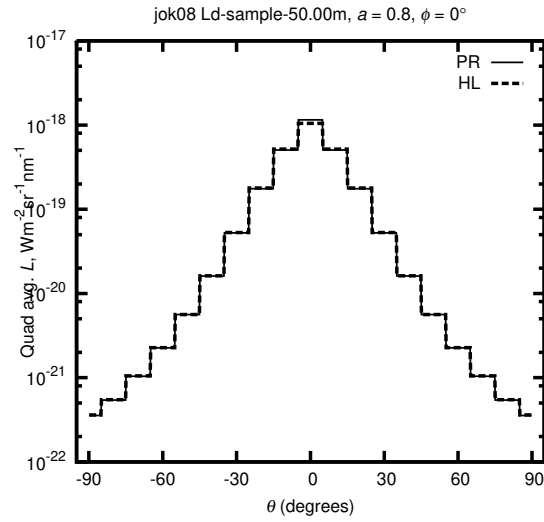
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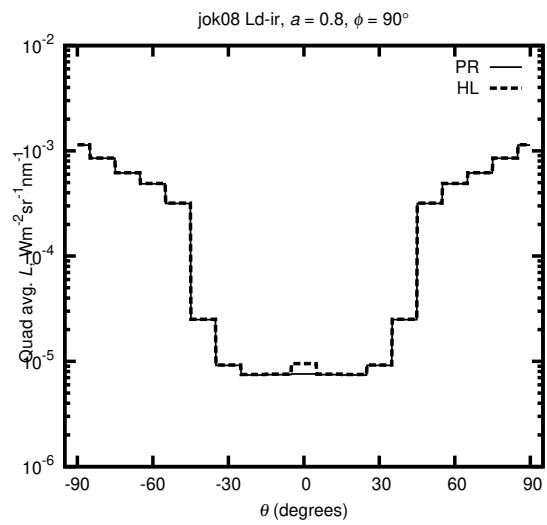
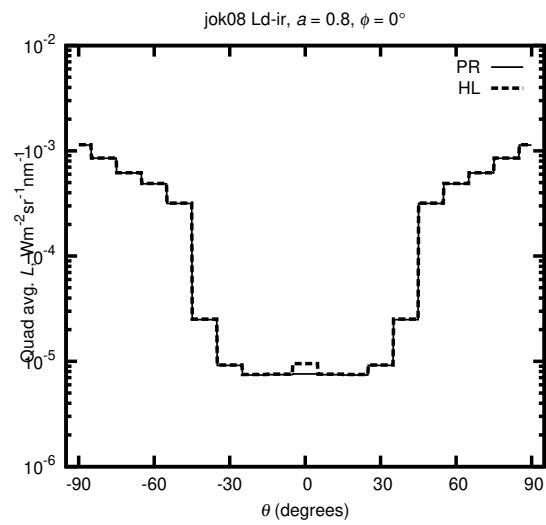
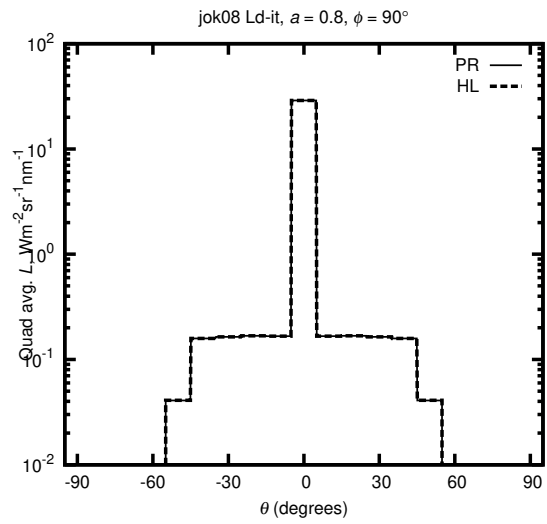
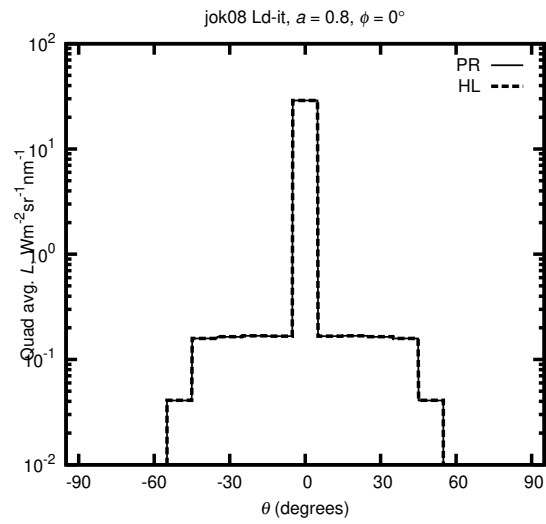
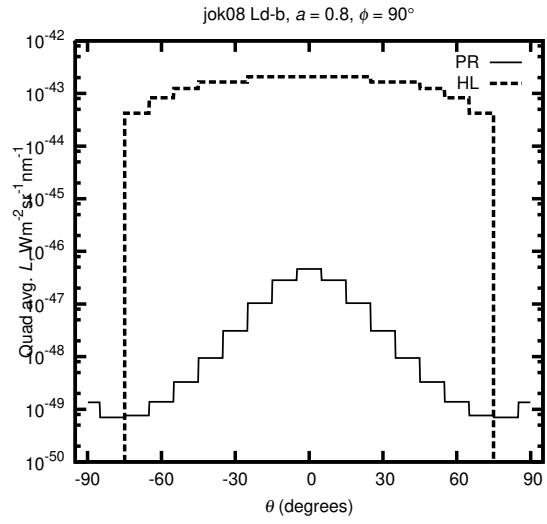
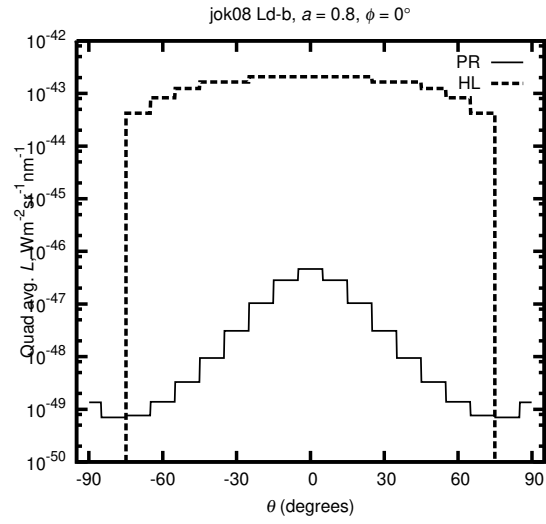
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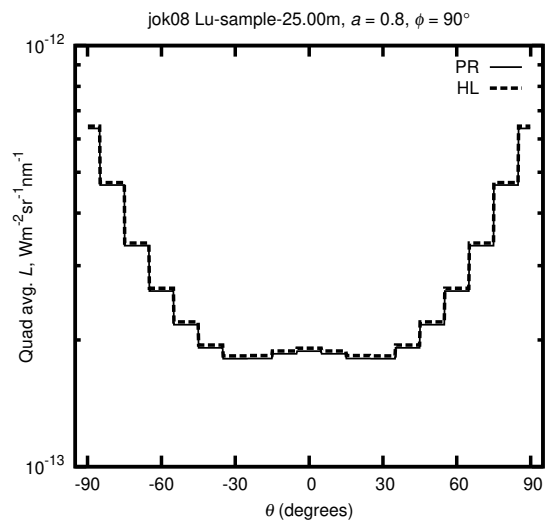
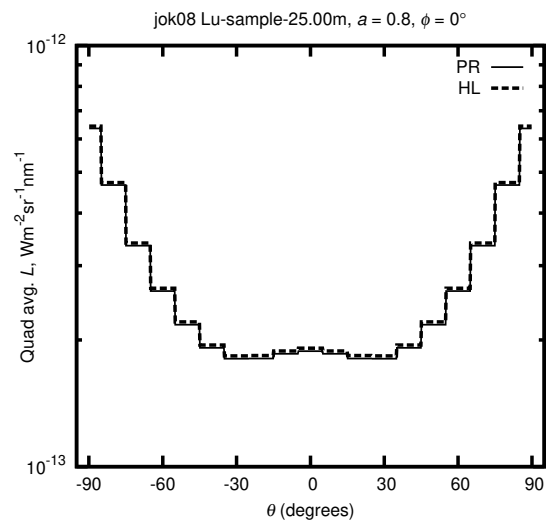
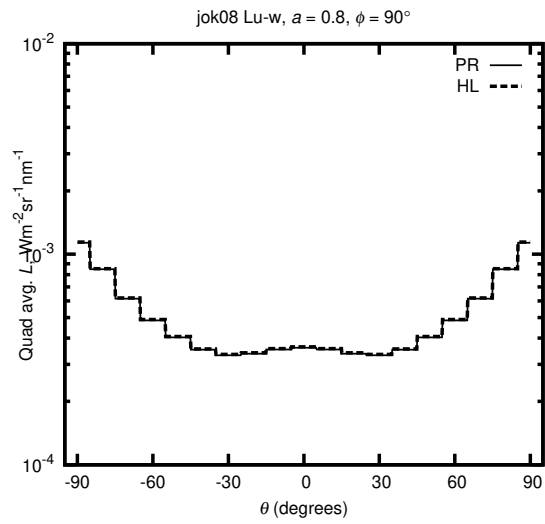
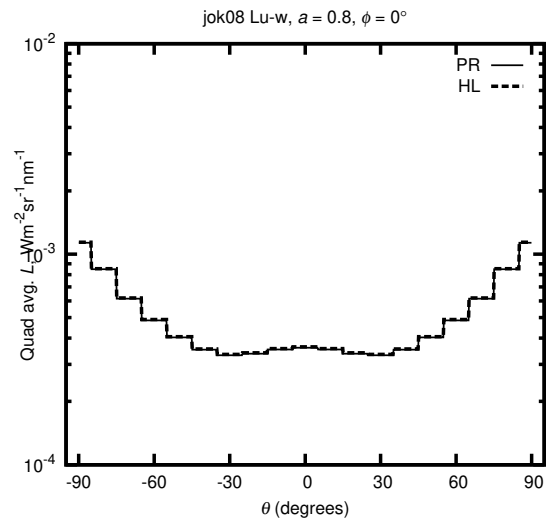
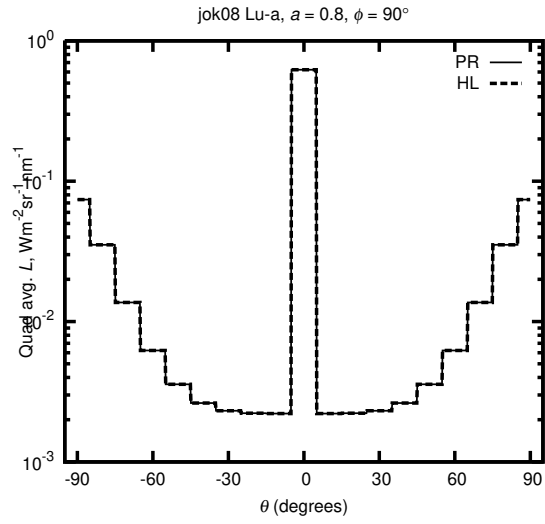
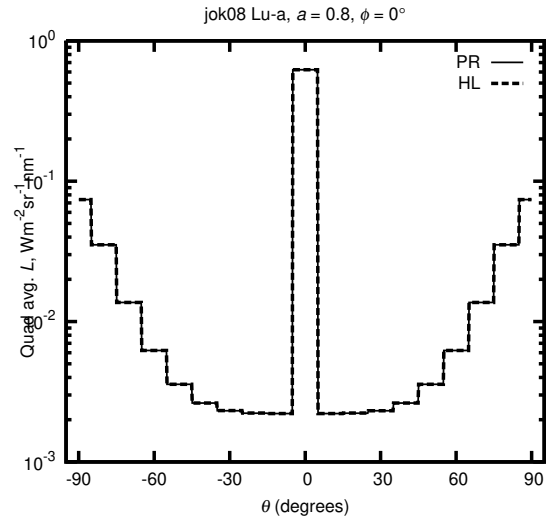
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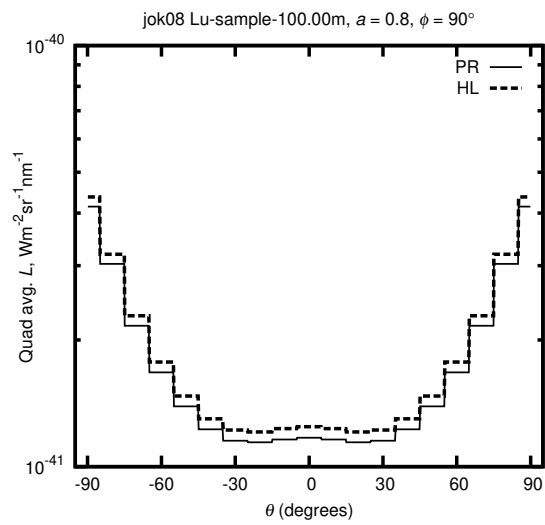
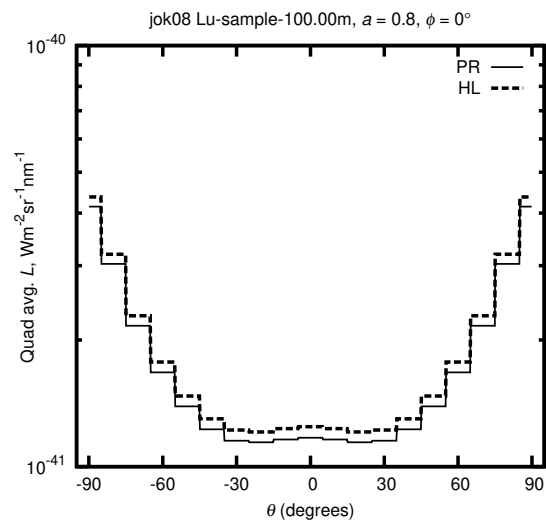
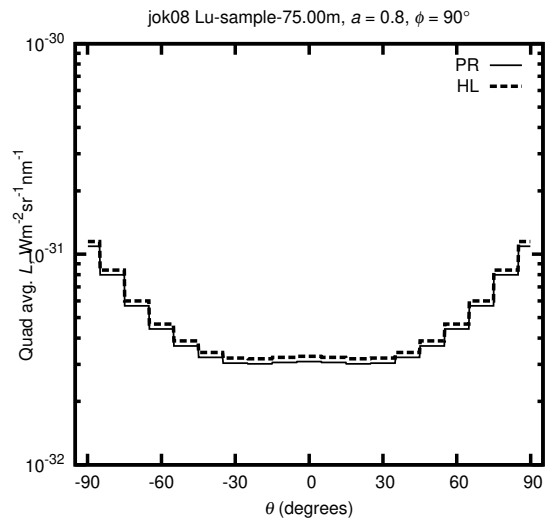
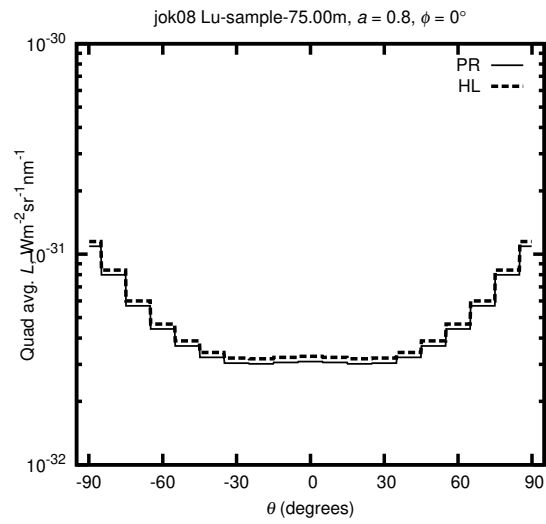
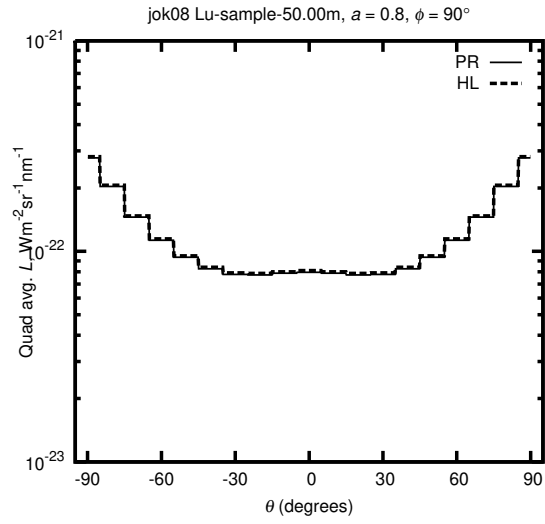
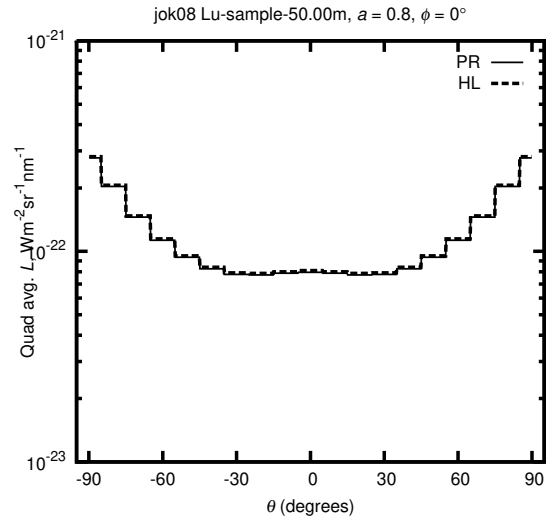
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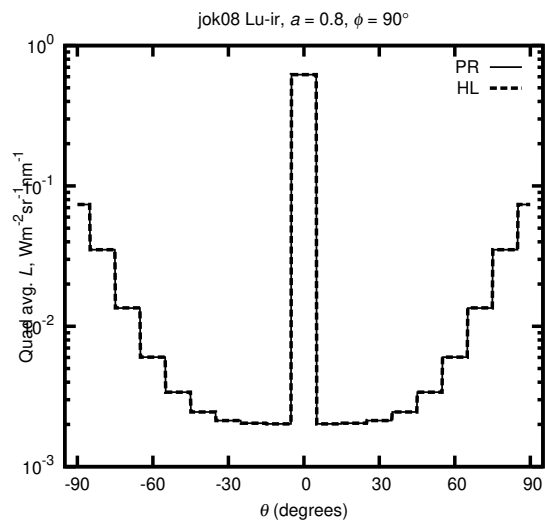
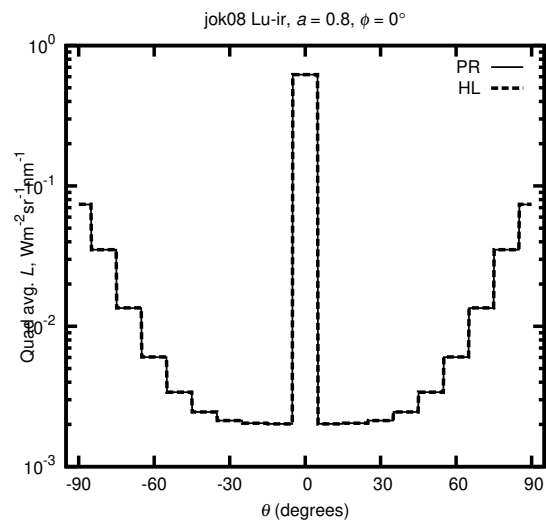
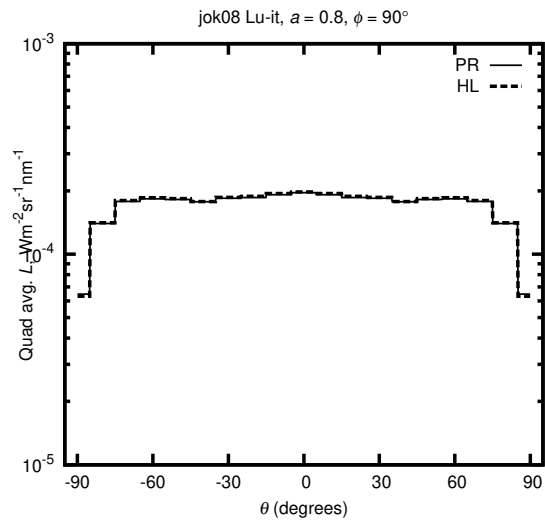
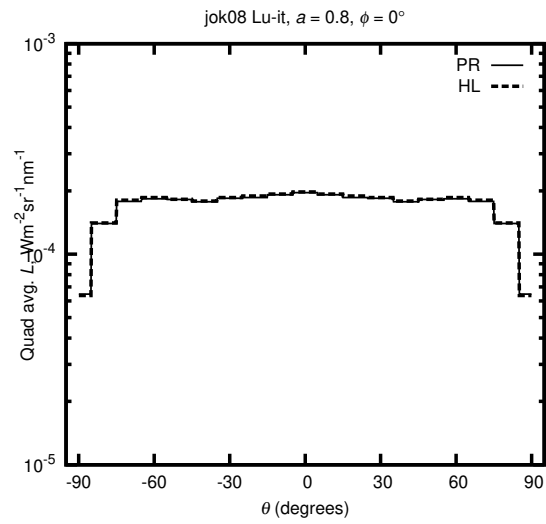
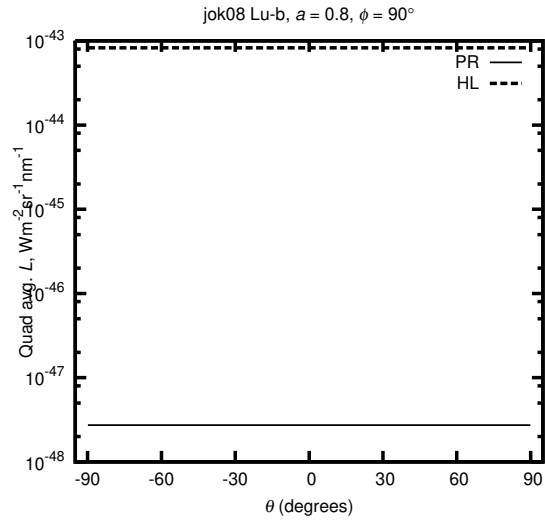
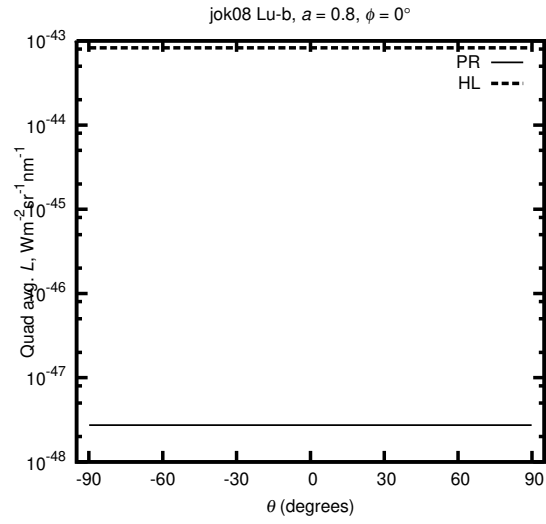
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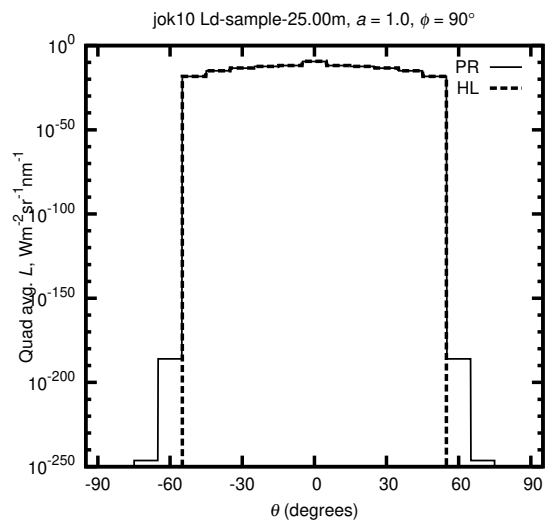
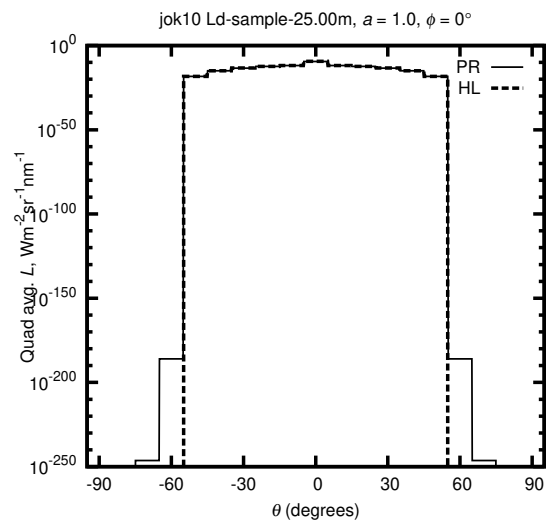
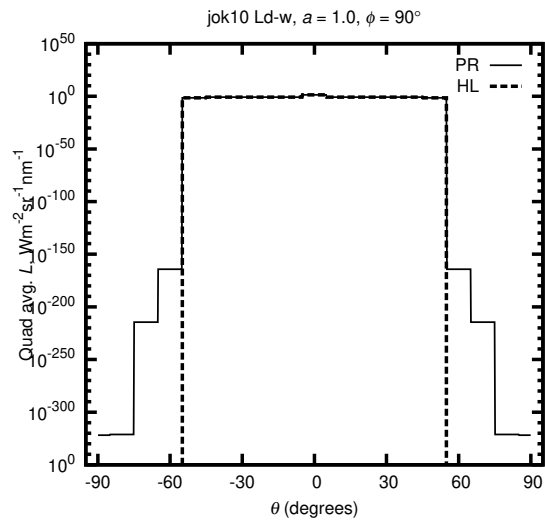
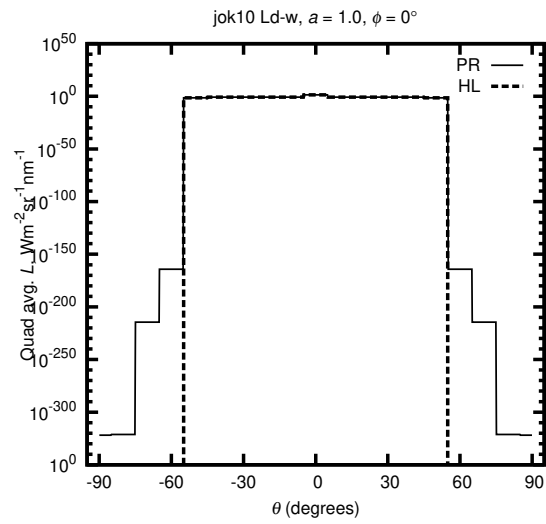
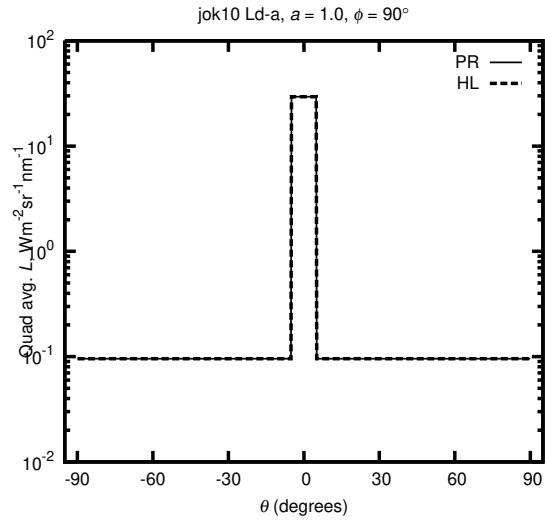
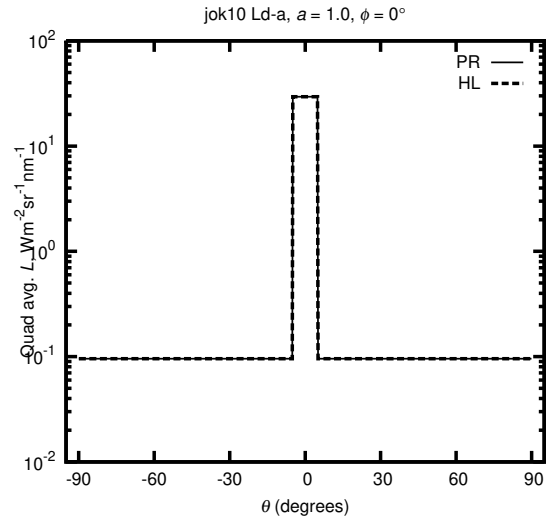
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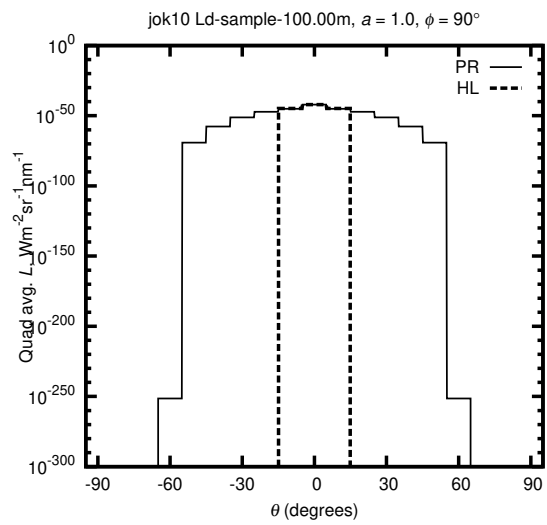
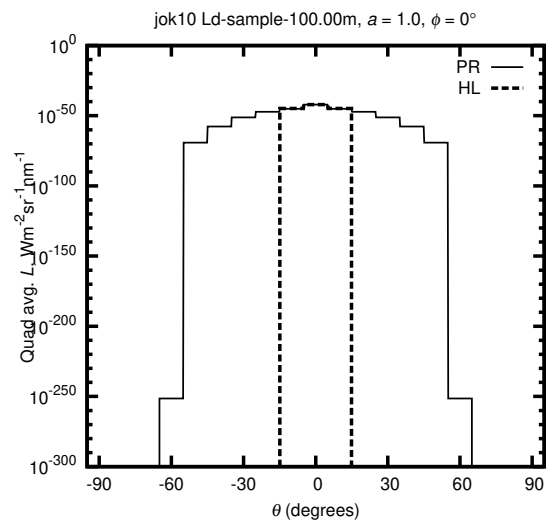
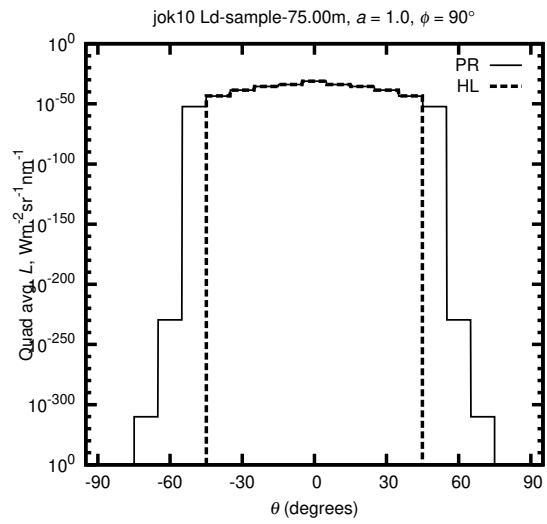
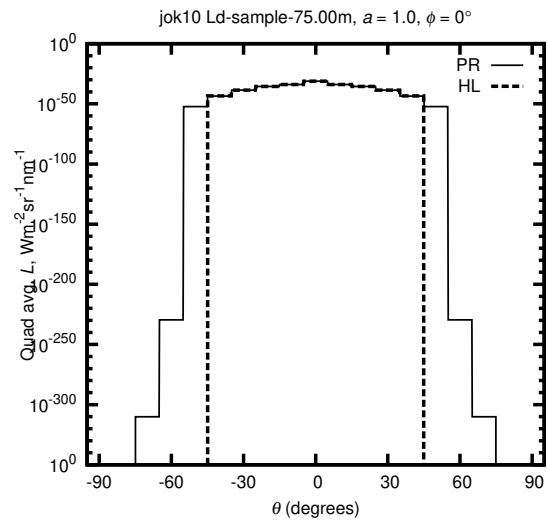
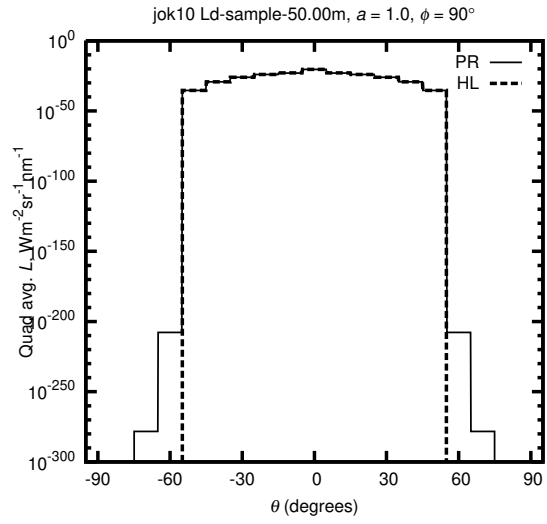
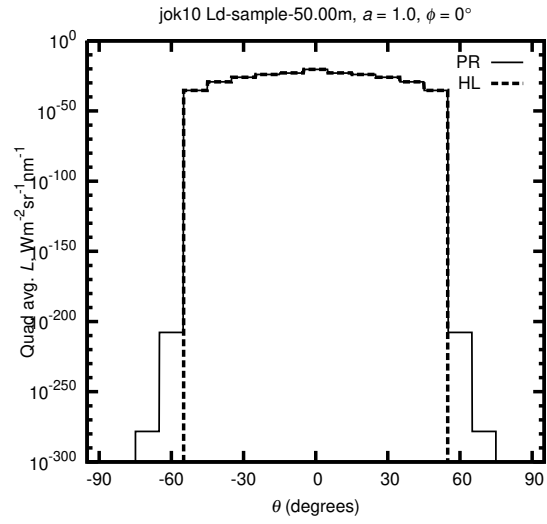
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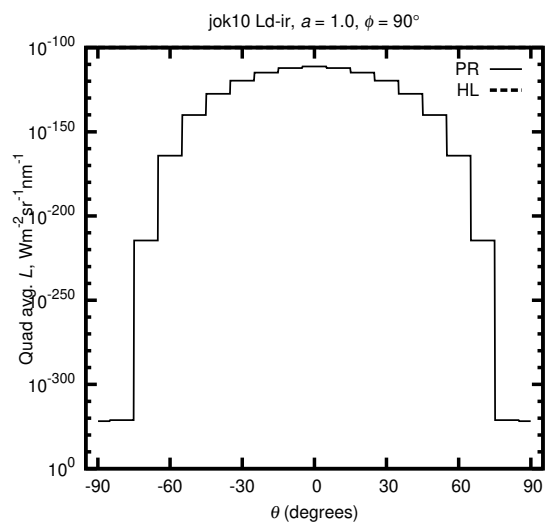
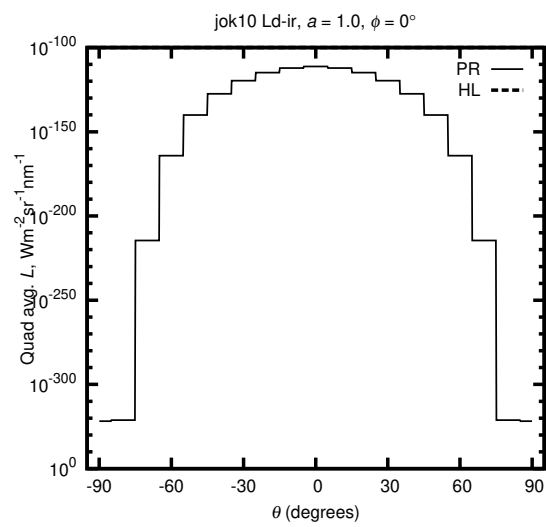
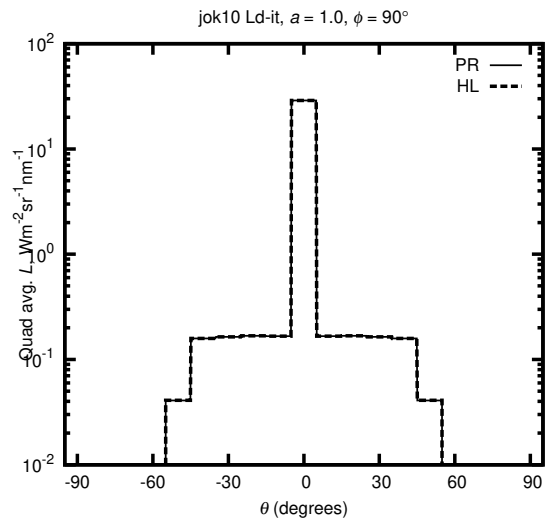
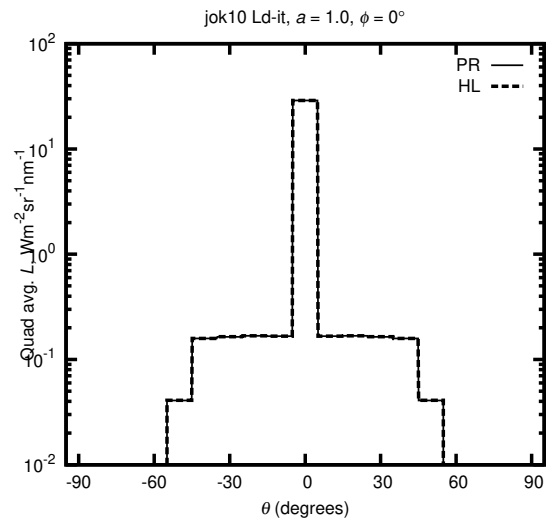
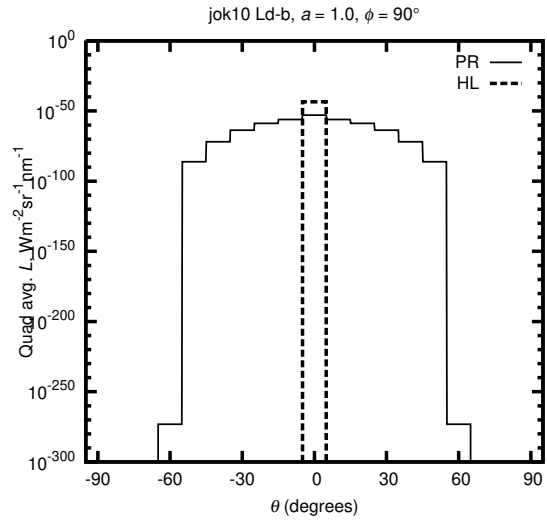
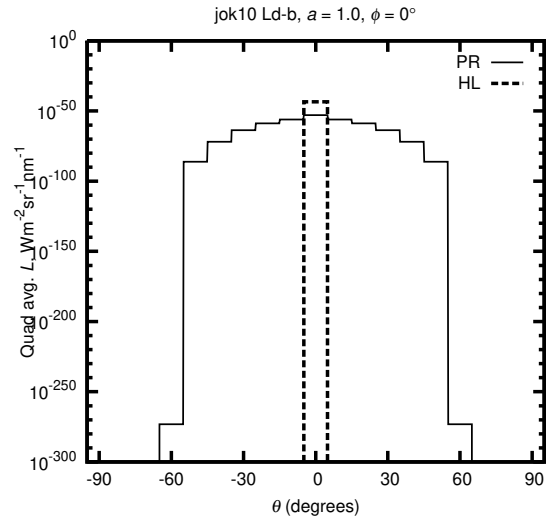
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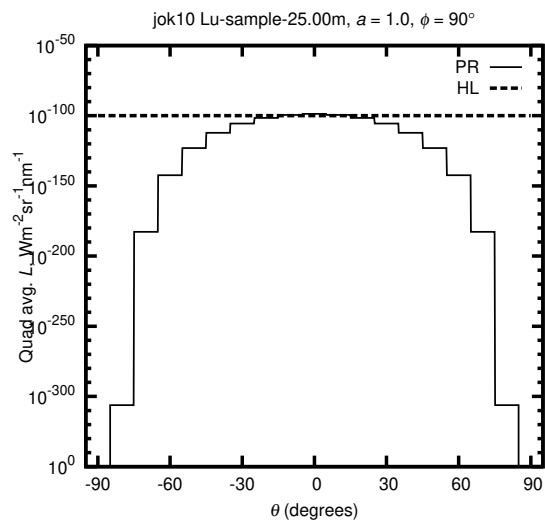
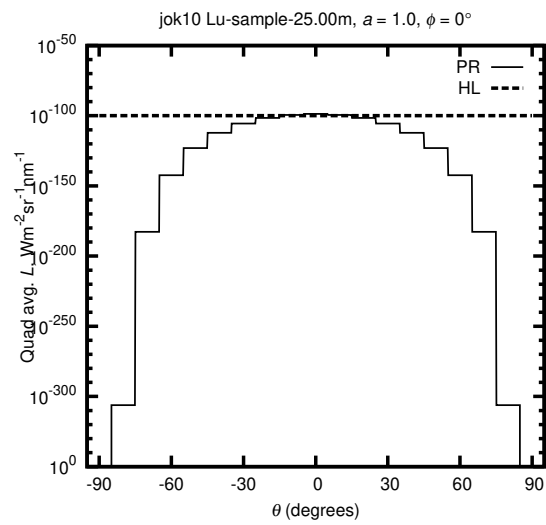
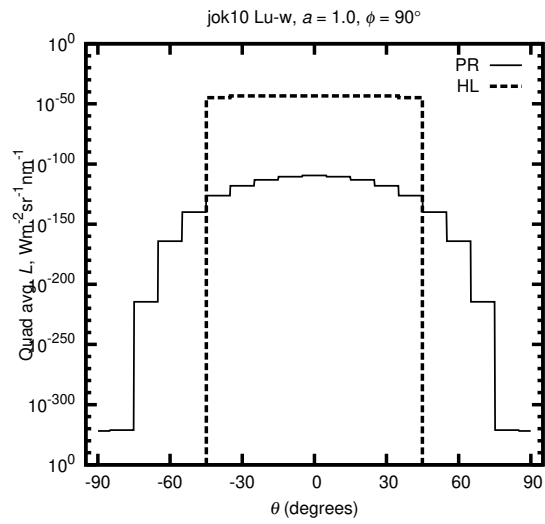
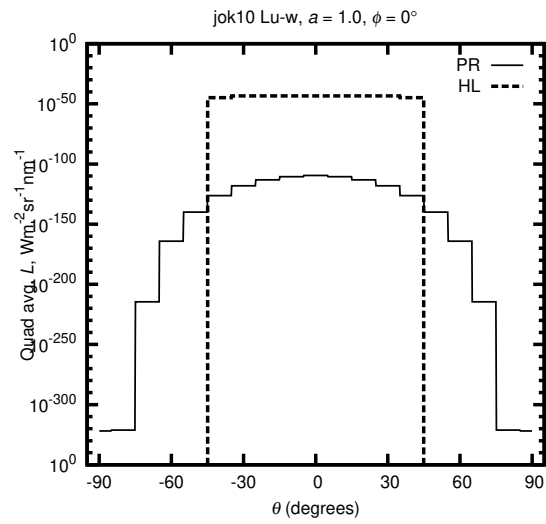
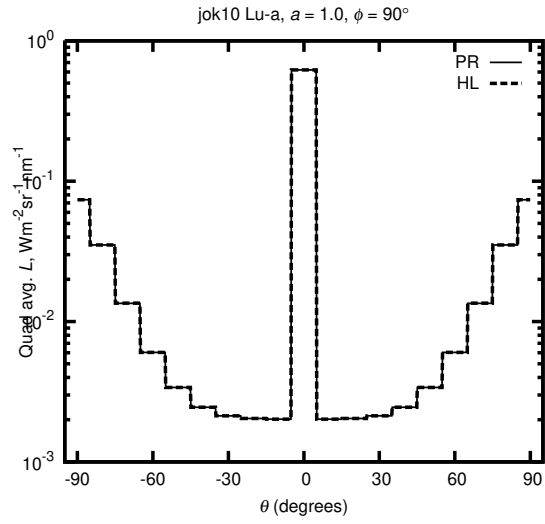
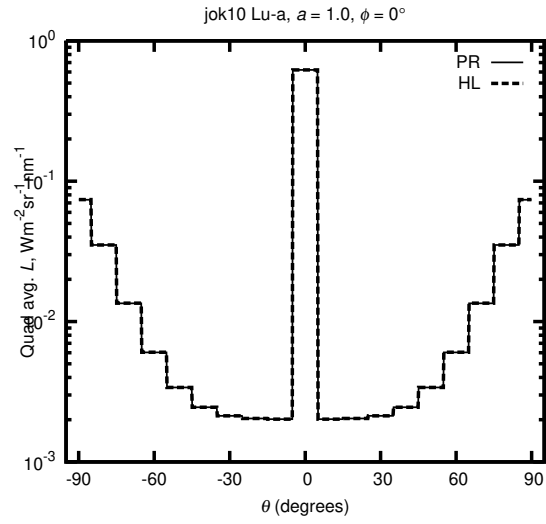
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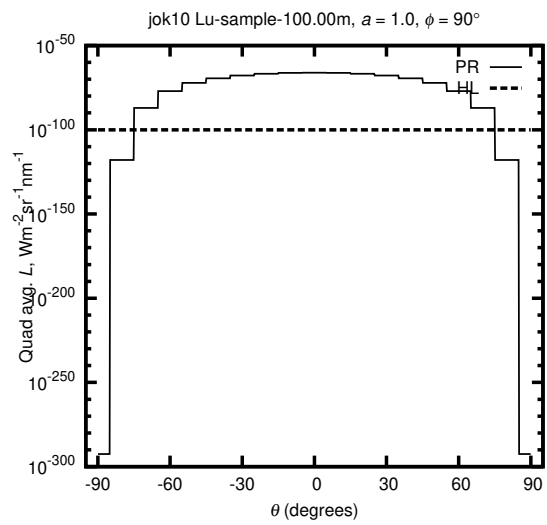
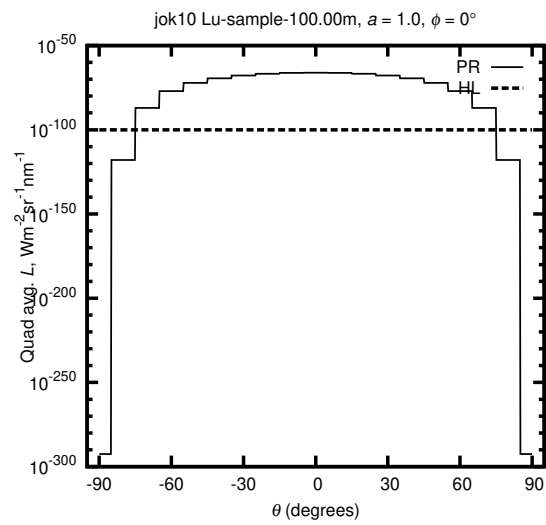
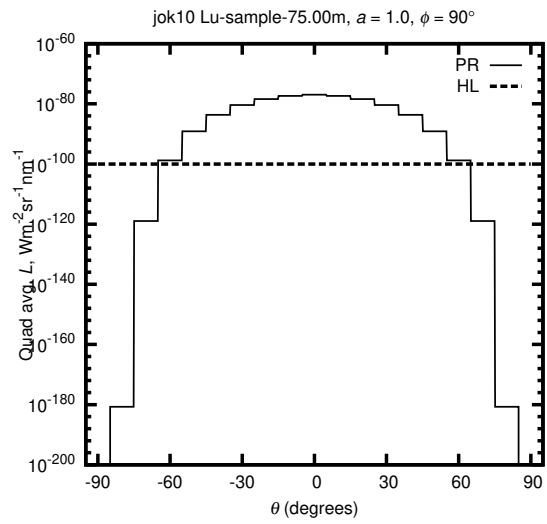
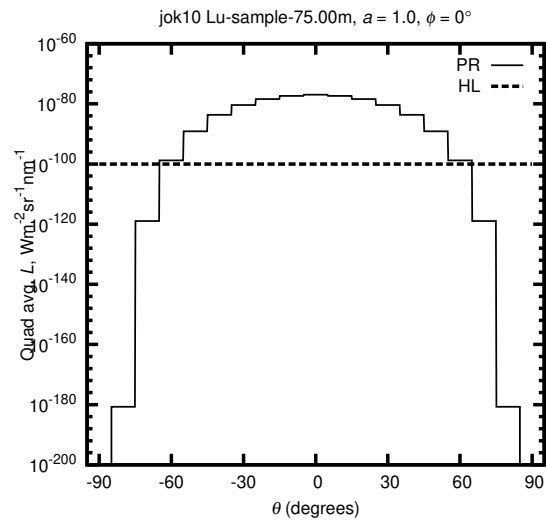
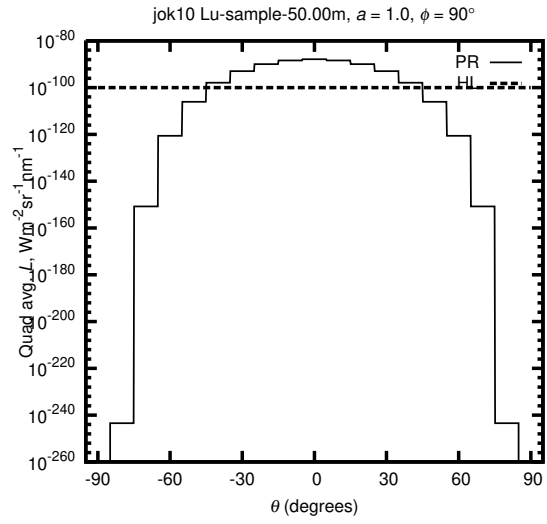
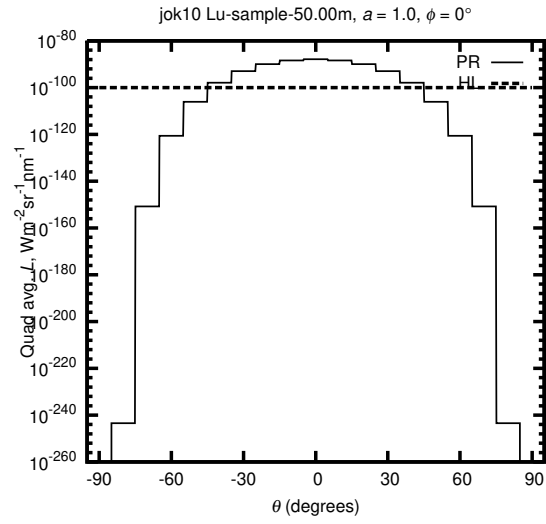
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