

ROPIC The Radio Occultation Processing Center Intercomparison Campaign



GRAS SAF



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Current Affiliation ESA/ESTEC



European Space Agency
Agence spatiale européenne

Rational for ROPIC

**Validation and Intercomparison
of
Algorithms and Implementations
concerning
Geometric Optics vs. Wave Optics
Atmospheric Conditions
(*Winter vs. Summer Season*)**

**Participants: GRAS-SAF, DWD, WEGC
What we have: Comprehensive Data Set
Presented Today: Bending Angle & Refractivities**

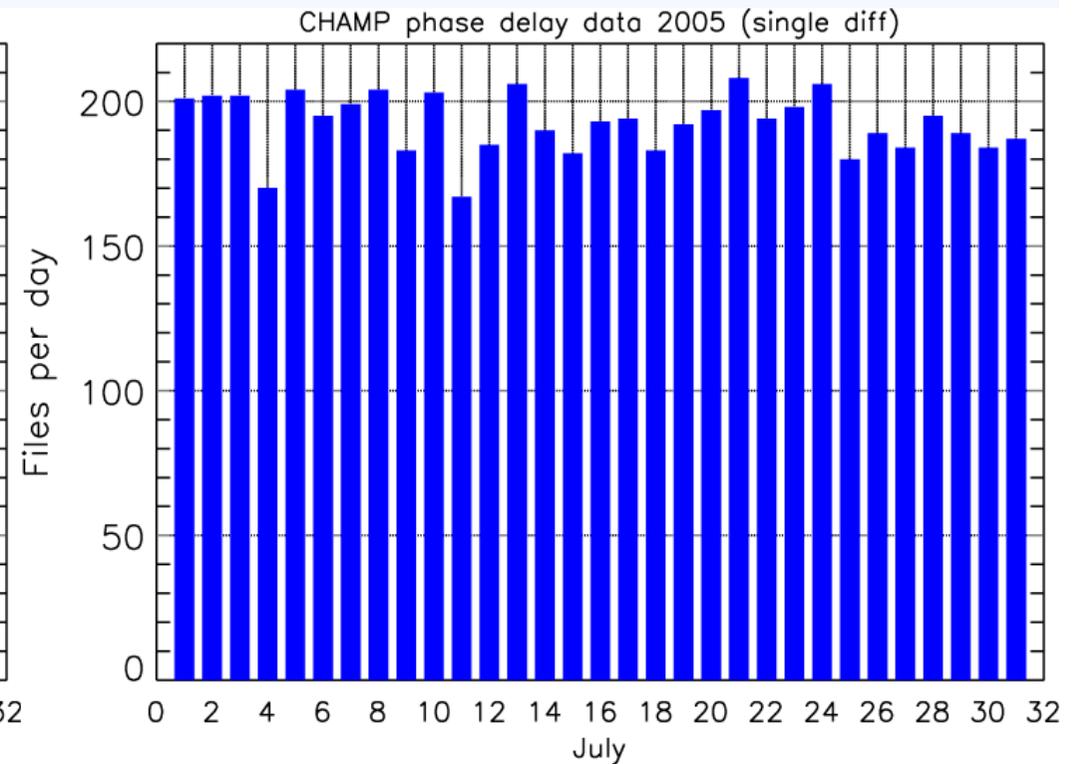
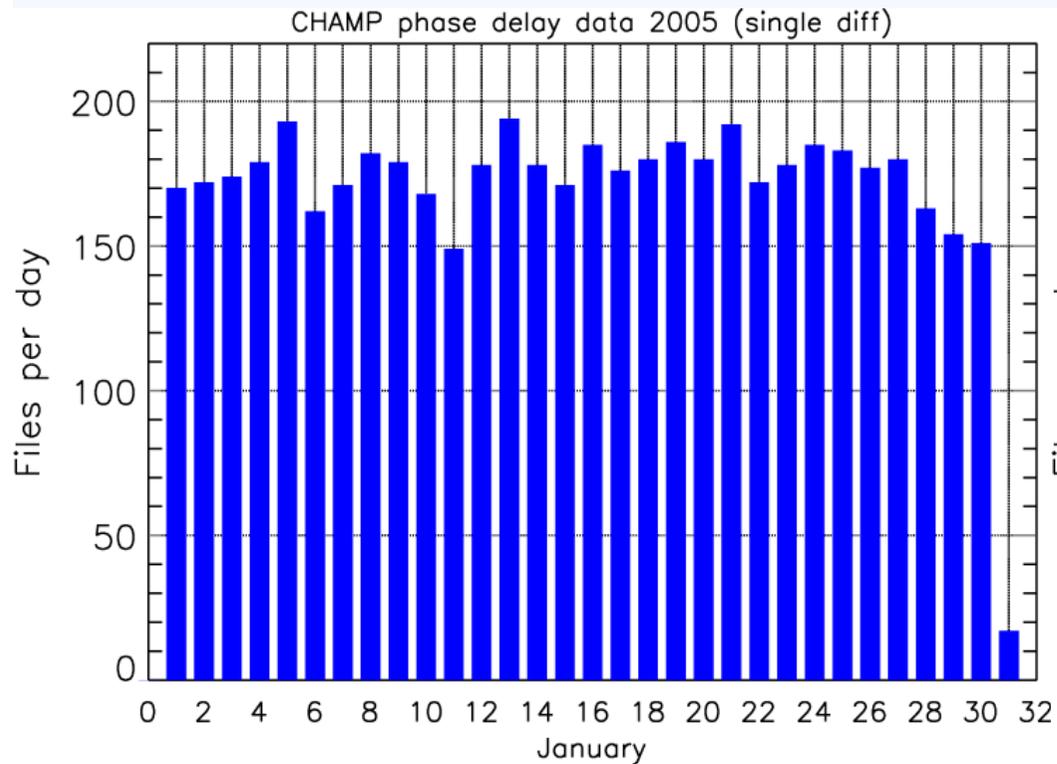


The Data Set

Used Time Window 2005, Total Number of Days 365						
January No. of Days:			001 - 031			
July No. of Days:			182 - 212			
	January		July		Total	
GFZ Phase & Orbit	5246		5928		11174	
	Passed	Failed	Passed	Failed	Passed	Failed
DMI	4272	974	4932	996	9204	1970
DWD	4439	807	5066	862	9505	1669
WEGC	3074	2172	3627	2301	6701	4473

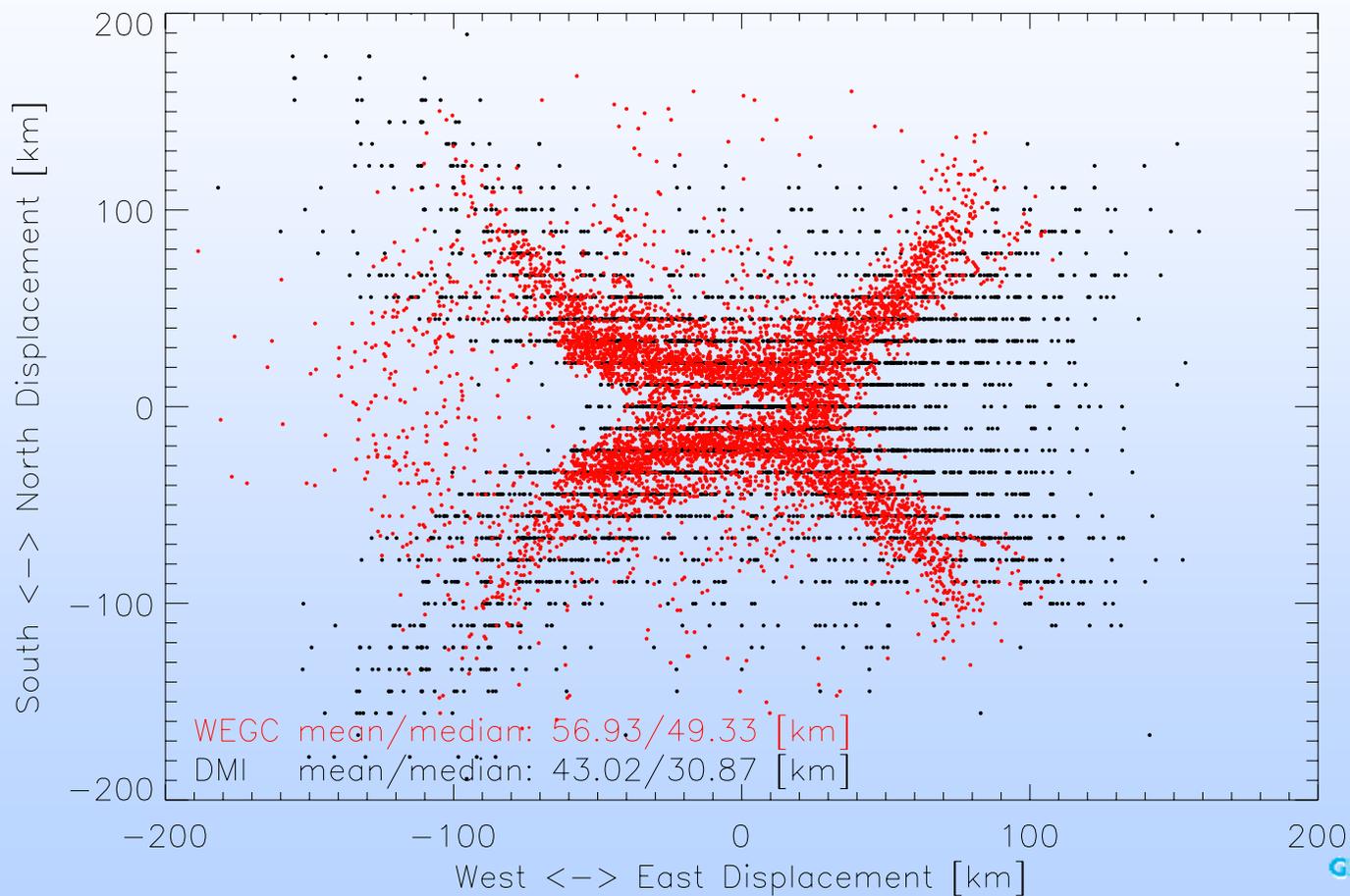


Common Data Set



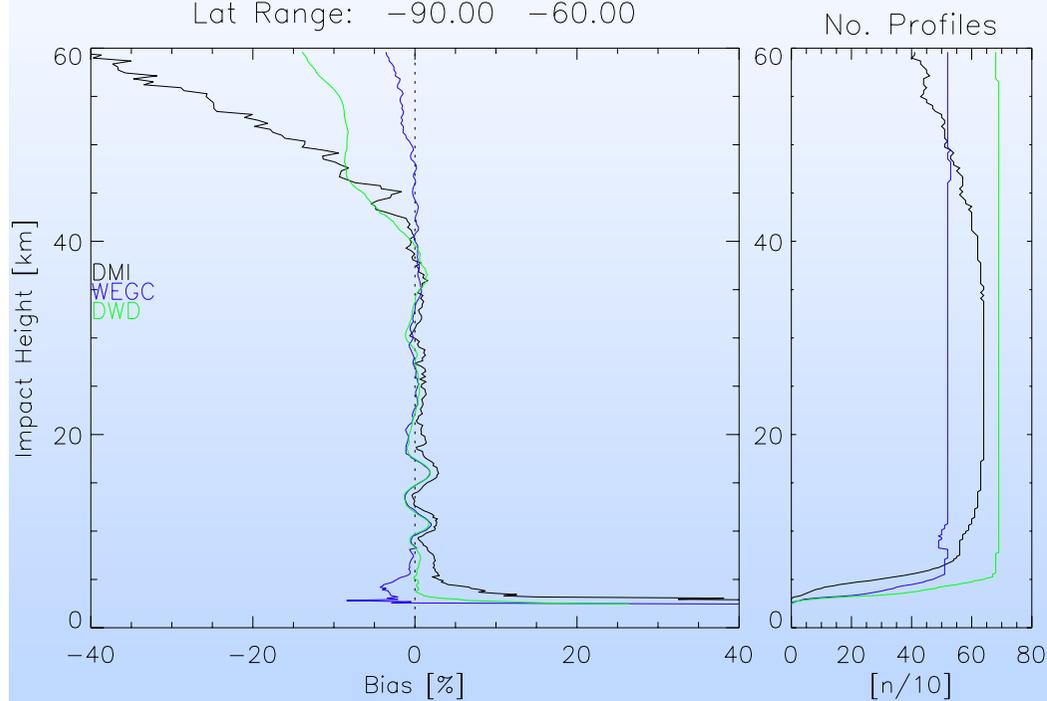
Geolocation

Bg. Geoloc. Diff. Global CHMP DWDwrt DMI-WEGC 2005
No. Profiles: 9198-6701

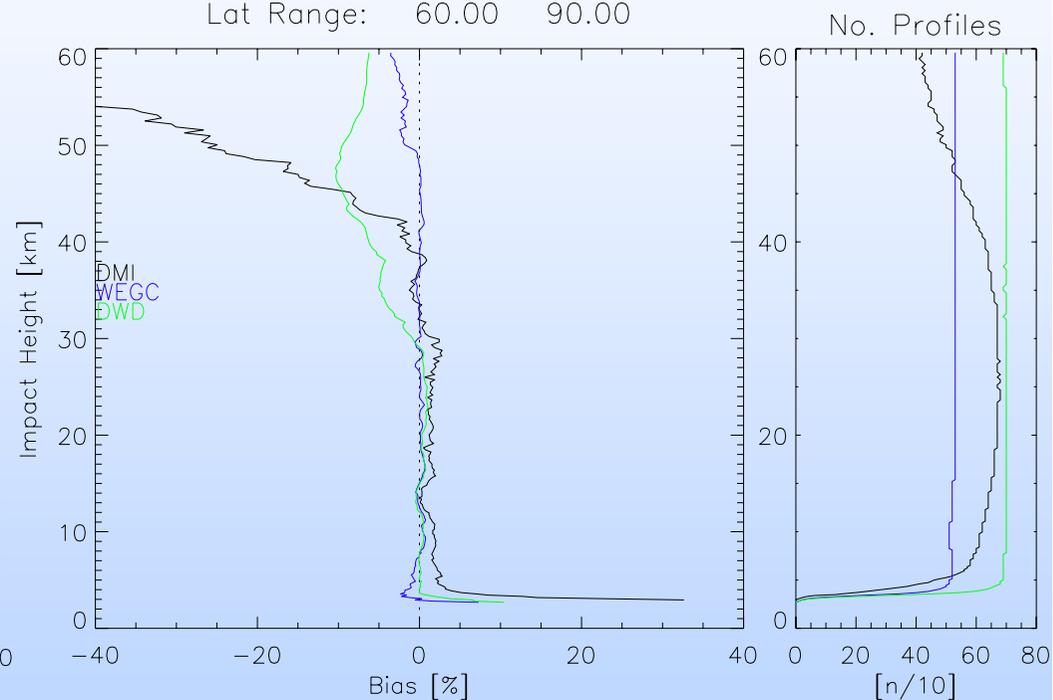


Bending Angle Bias

Bending Angle DWD wrt DMI-WEGC-DWD 1 2005
No. Profiles: 649- 530- 696
Lat Range: -90.00 -60.00



Bending Angle DWD wrt DMI-WEGC-DWD 1 2005
No. Profiles: 680- 539- 704
Lat Range: 60.00 90.00

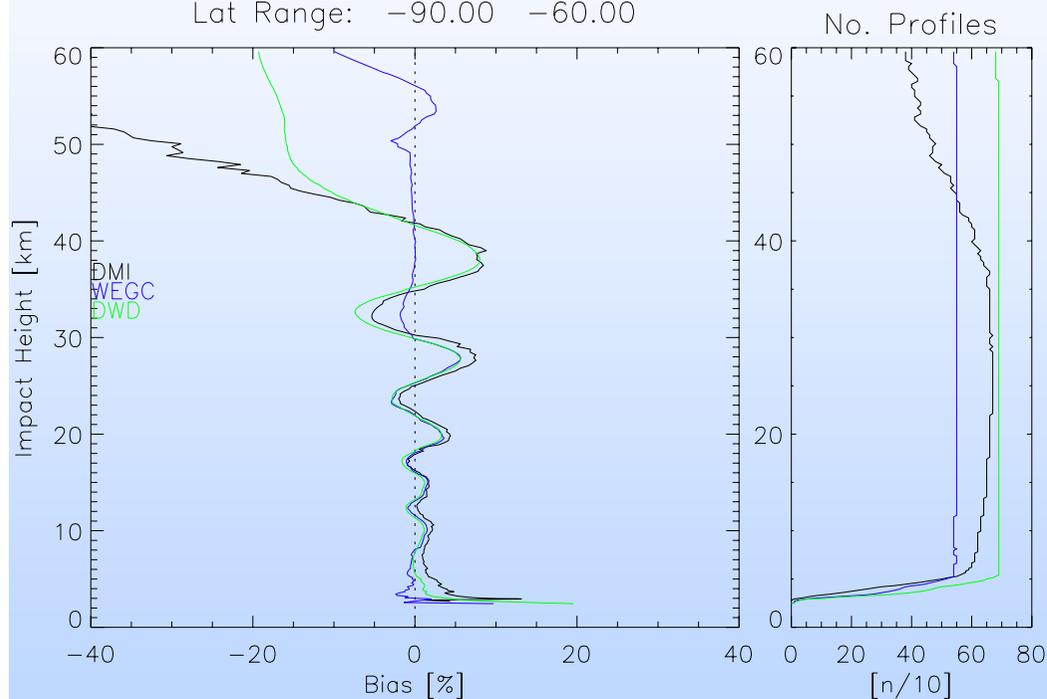


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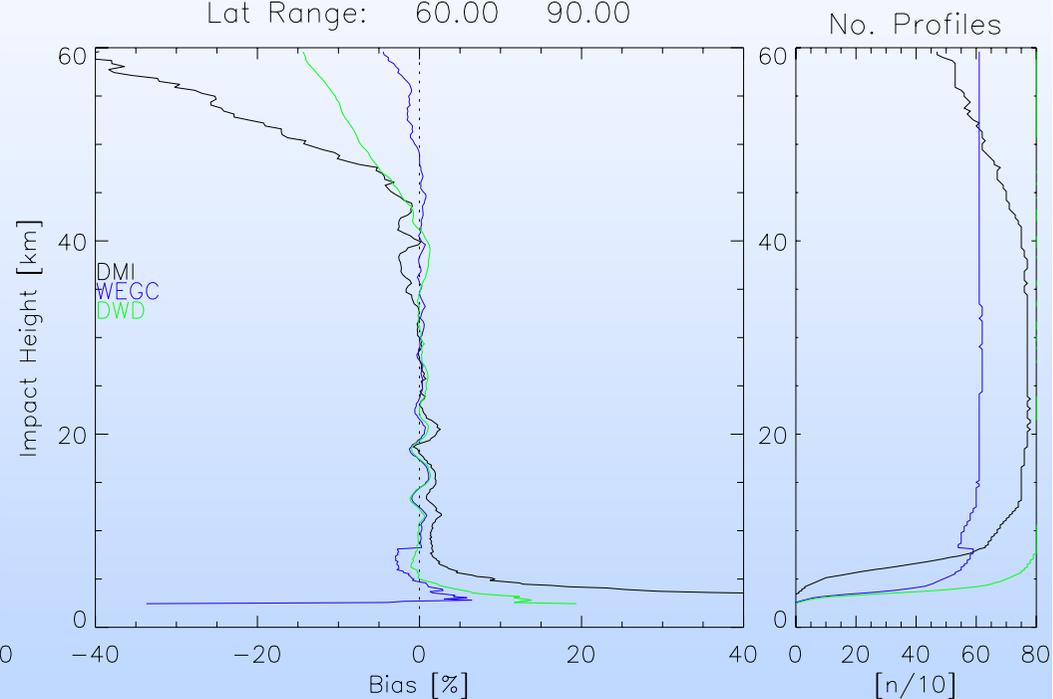


Bending Angle Bias

Bending Angle DWD wrt DMI-WEGC-DWD 7 2005
No. Profiles: 672- 555- 698
Lat Range: -90.00 -60.00

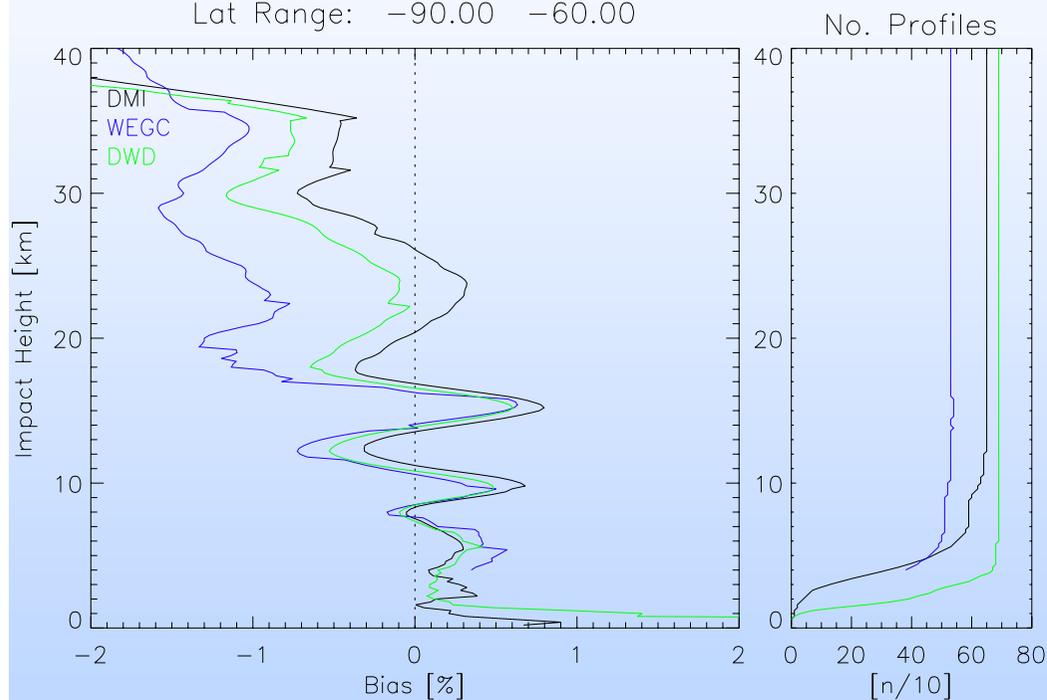


Bending Angle DWD wrt DMI-WEGC-DWD 7 2005
No. Profiles: 780- 620- 811
Lat Range: 60.00 90.00

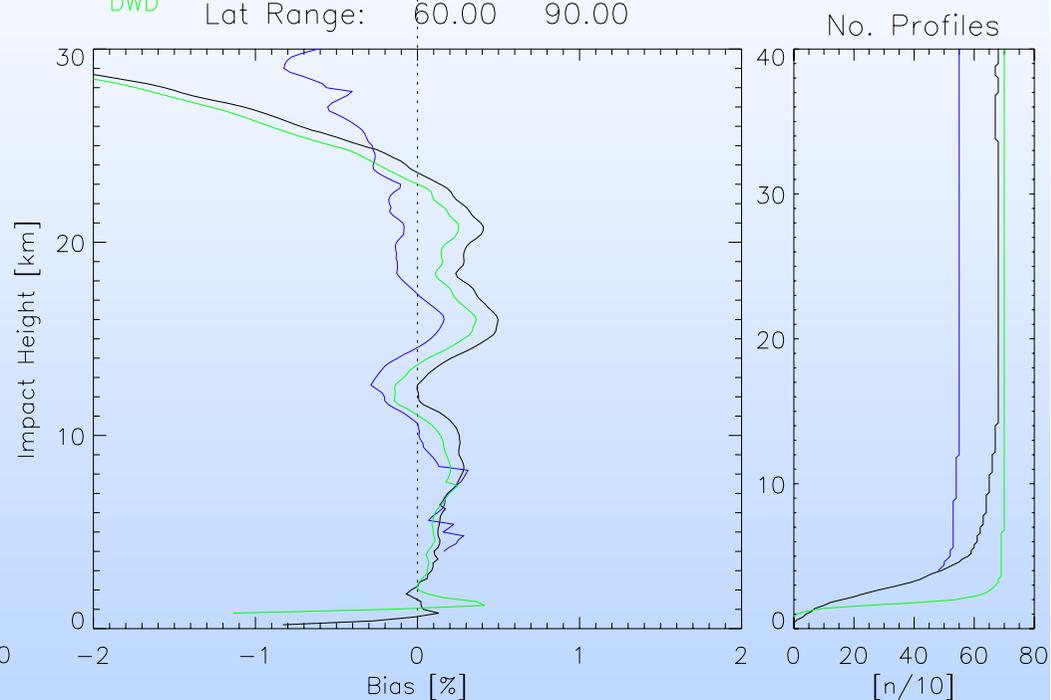


Refractivity Bias

Refractivity DWD wrt DMI -WEGC-DWD 1 2005
 No. Profiles: 652- 540- 696
 Lat Range: -90.00 -60.00



DMI
 WEGC
 DWD
 Refractivity DWD wrt DMI -WEGC-DWD 1 2005
 No. Profiles: 680- 556- 704
 Lat Range: 60.00 90.00

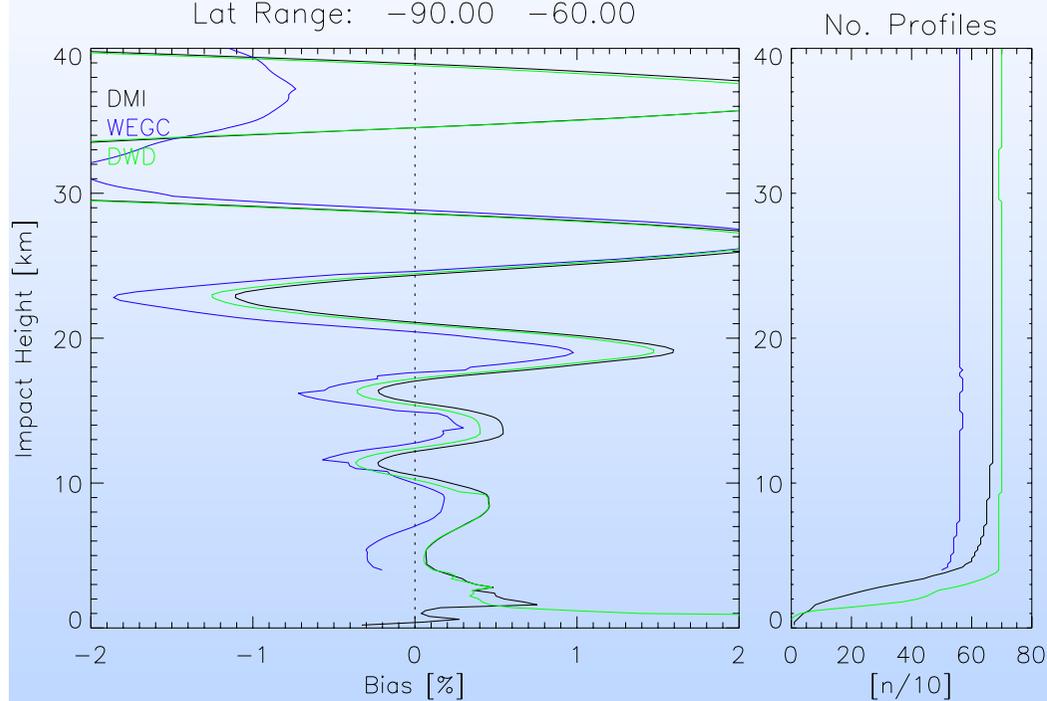


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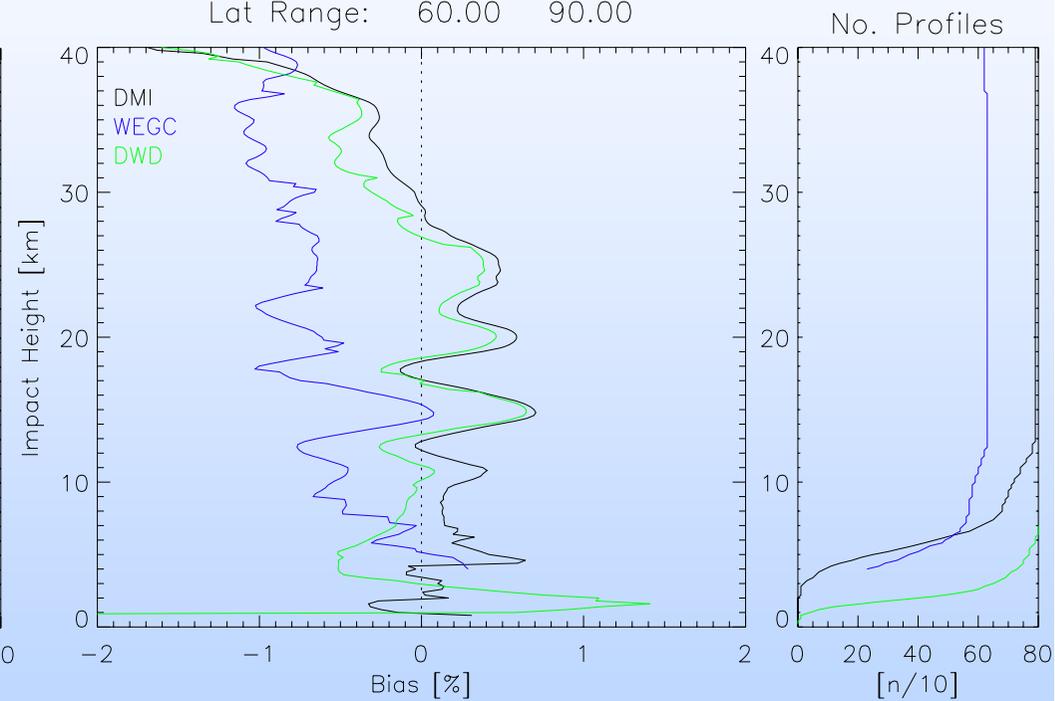


Refractivity Bias

Refractivity DWD wrt DMI -WEGC-DWD 7 2005
No. Profiles: 674- 570- 700
Lat Range: -90.00 -60.00



Refractivity DWD wrt DMI -WEGC-DWD 7 2005
No. Profiles: 794- 639- 813
Lat Range: 60.00 90.00

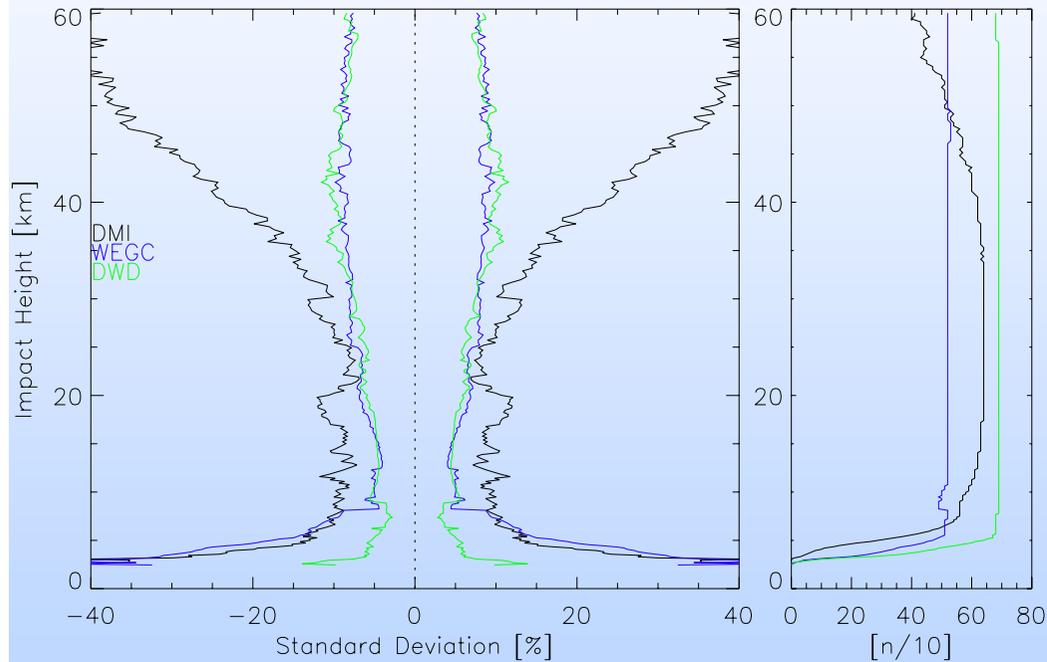


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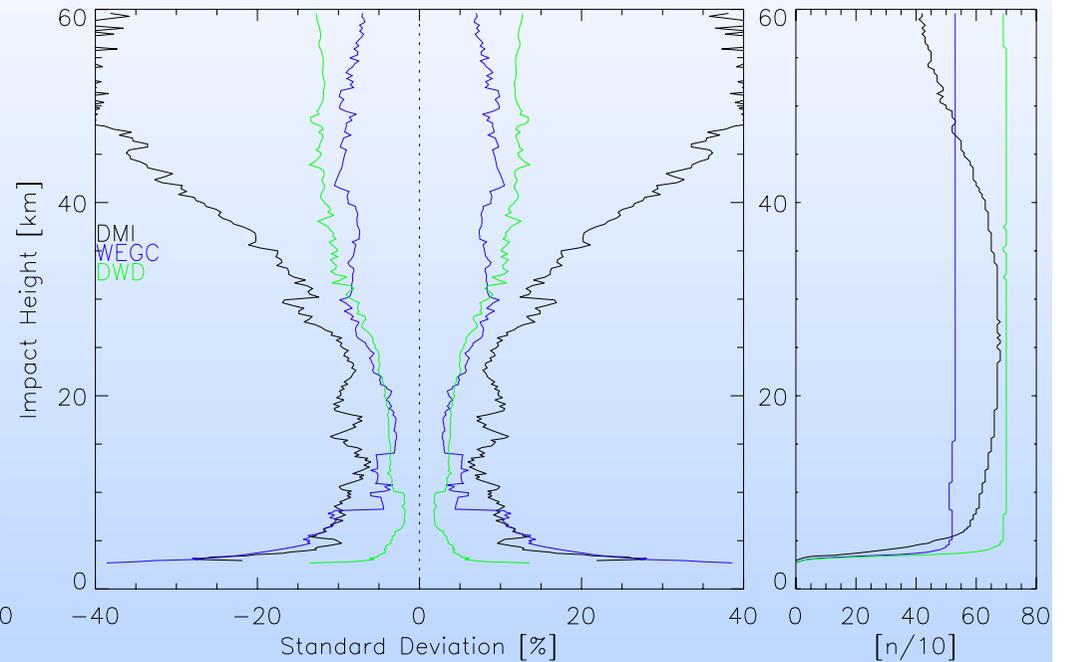


Bending Angle Standard Deviation

Bending Angle DWD wrt DMI-WEGC-DWD 1 2005
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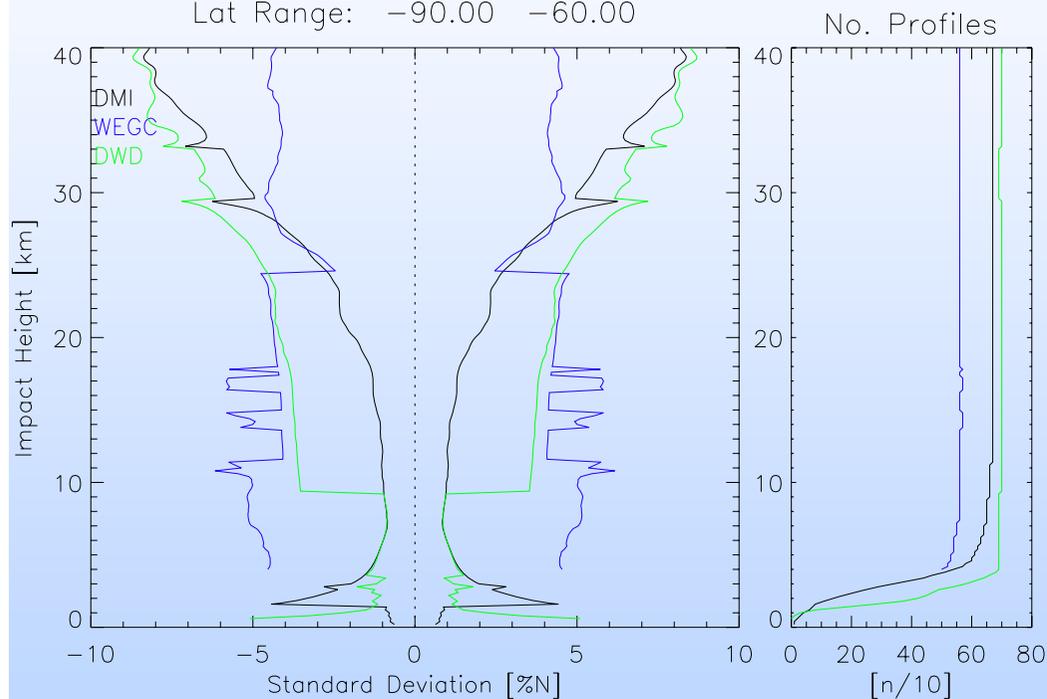


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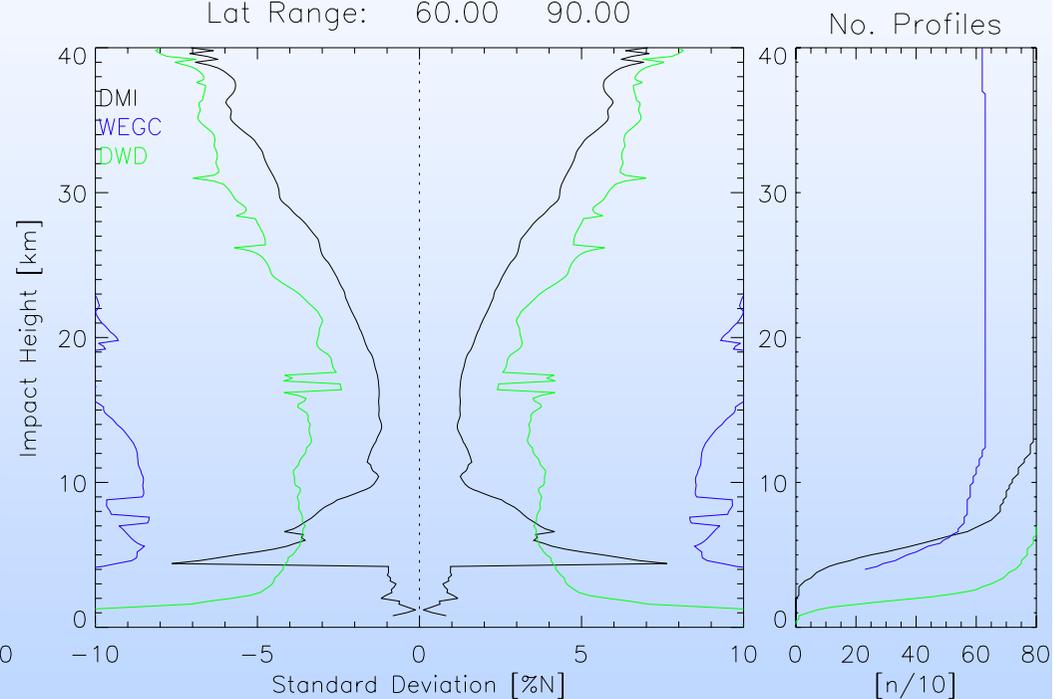


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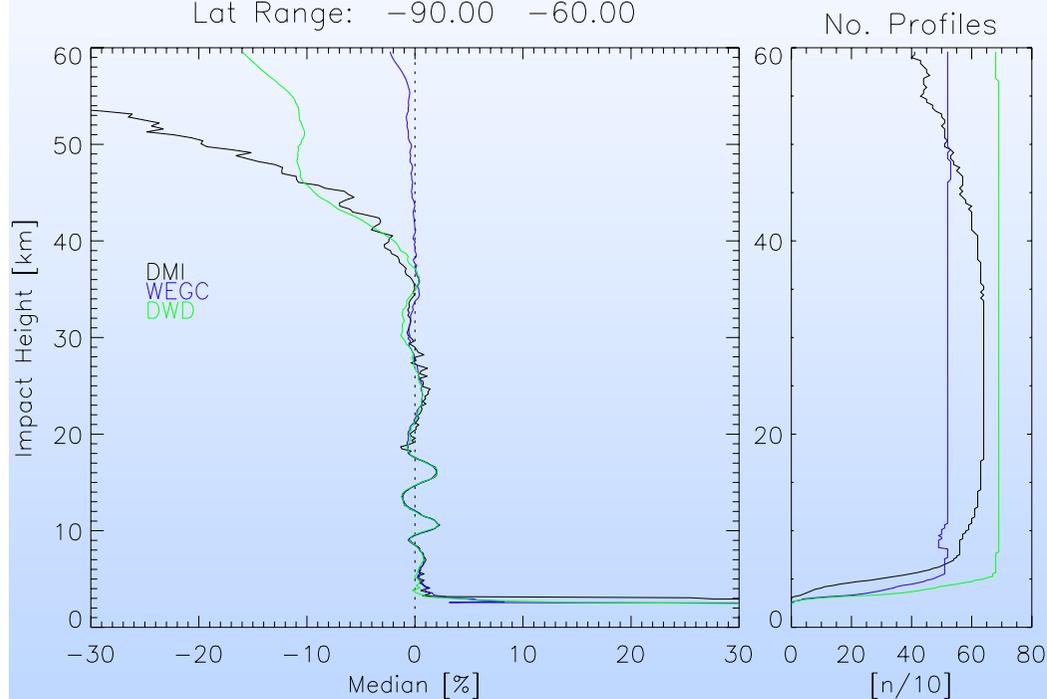


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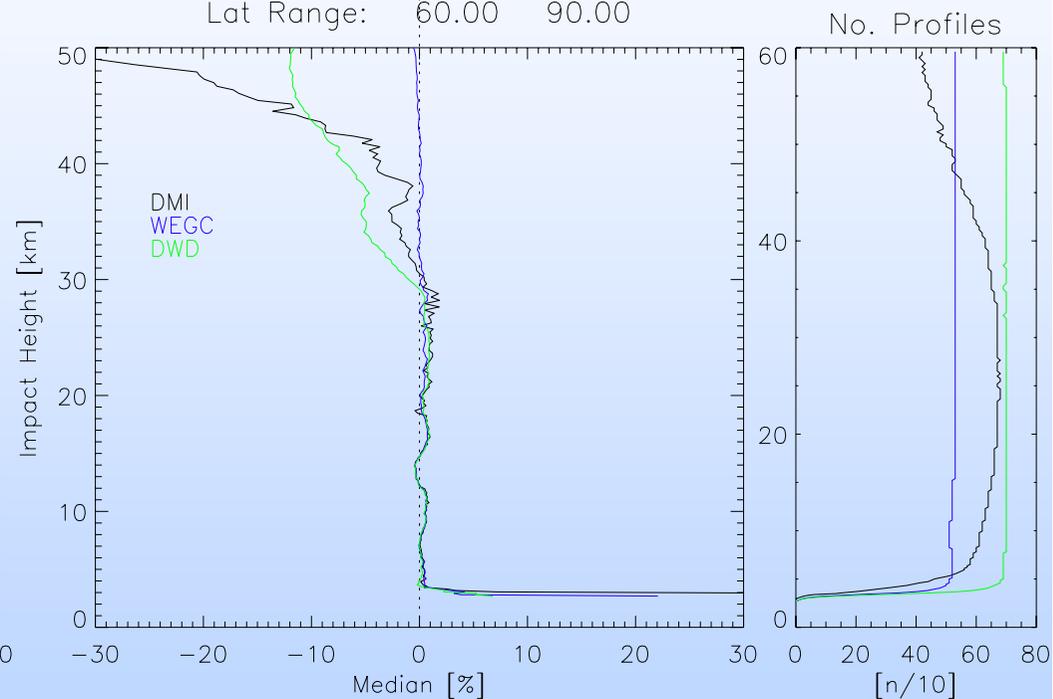


Bending Angle Median

Bending Angle DWDwrt DMI-WEGC-DWD 1 2005
No. Profiles: 649- 530- 696
Lat Range: -90.00 -60.00

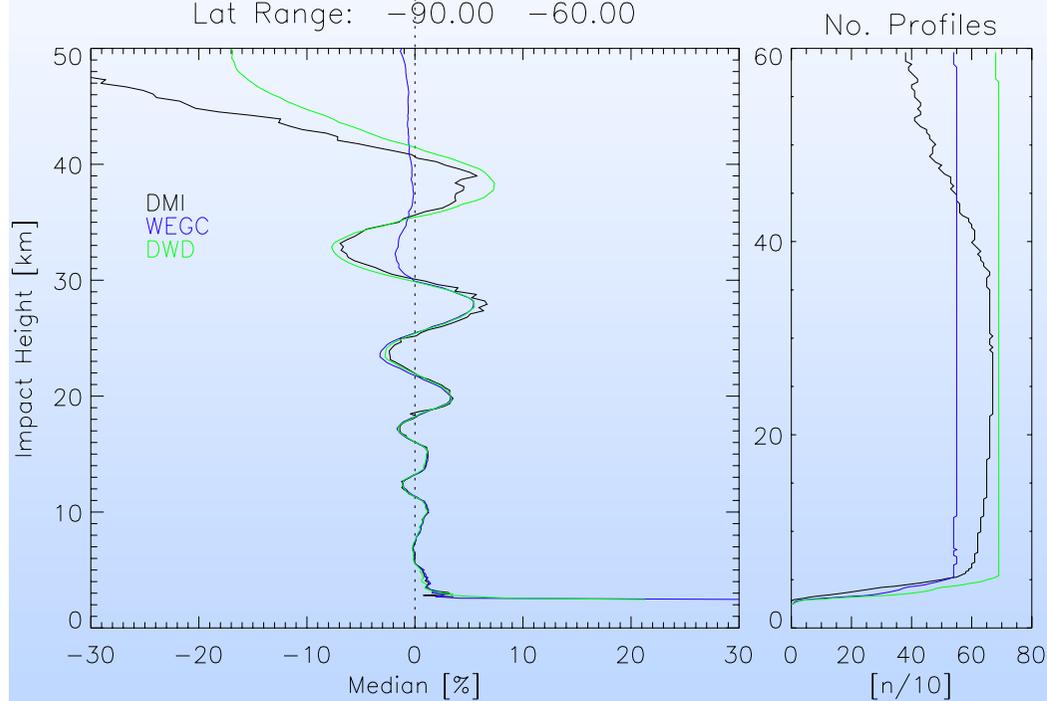


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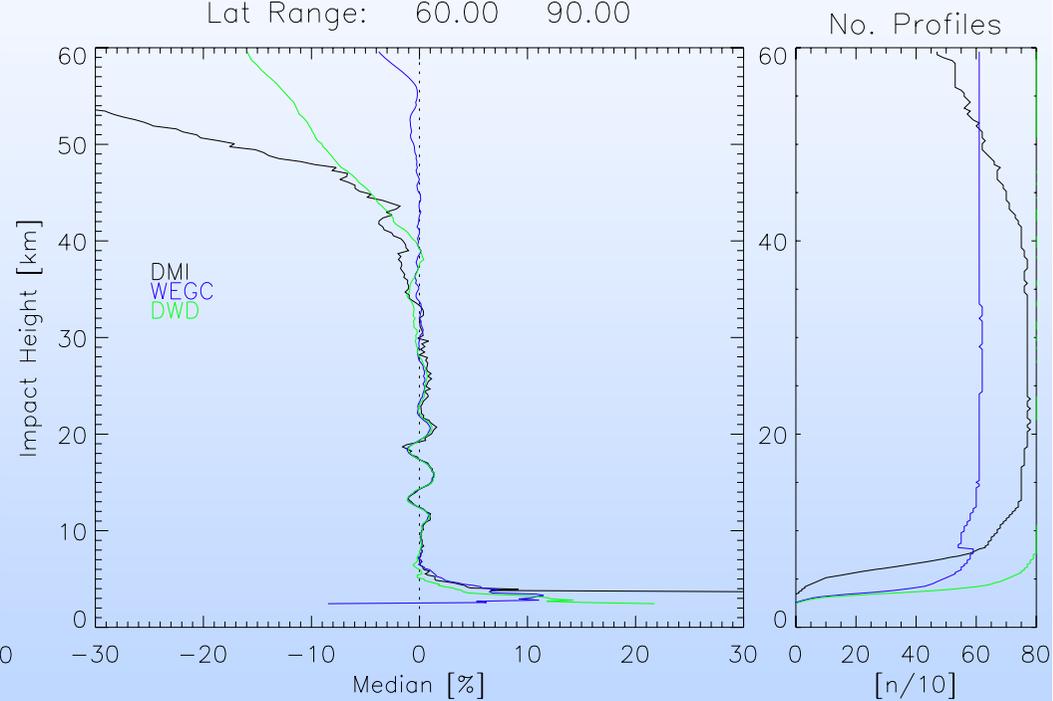


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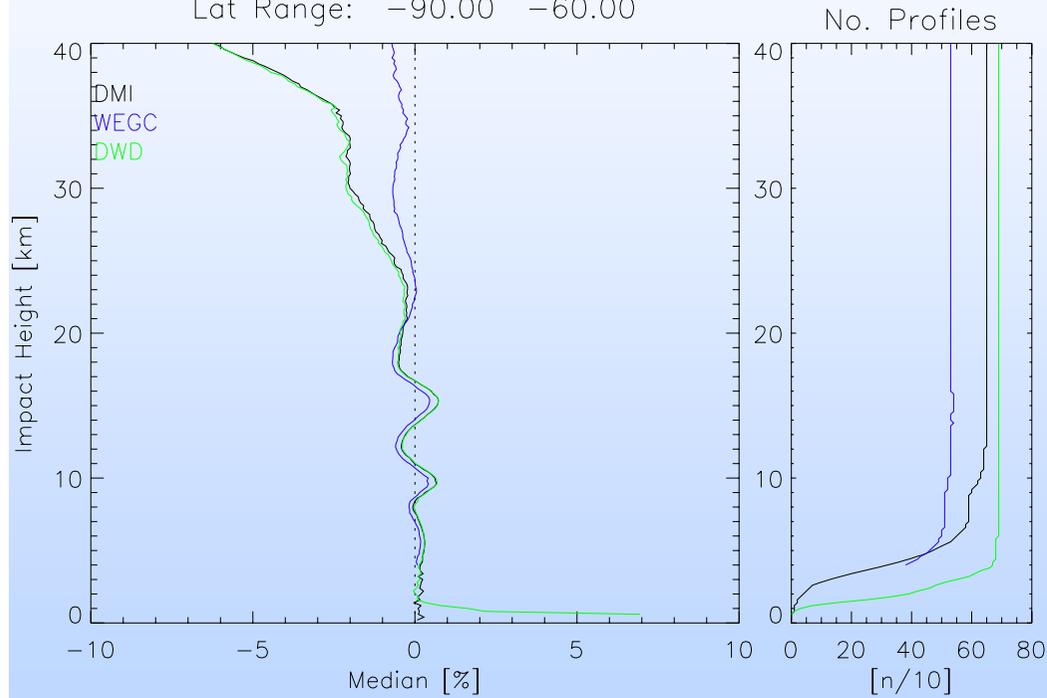


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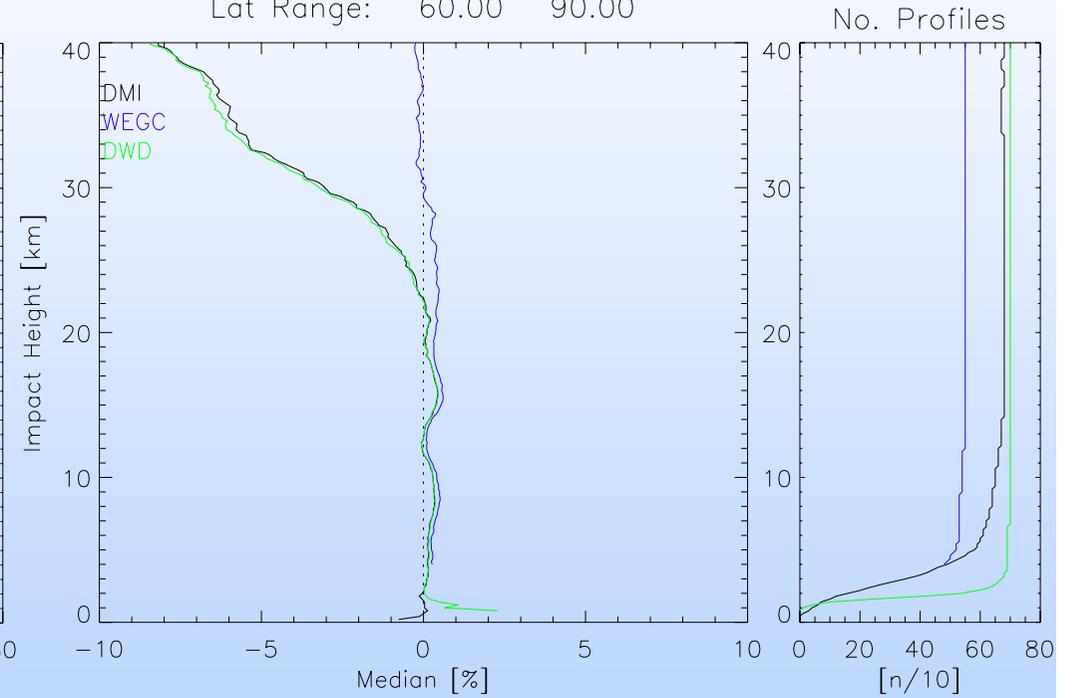


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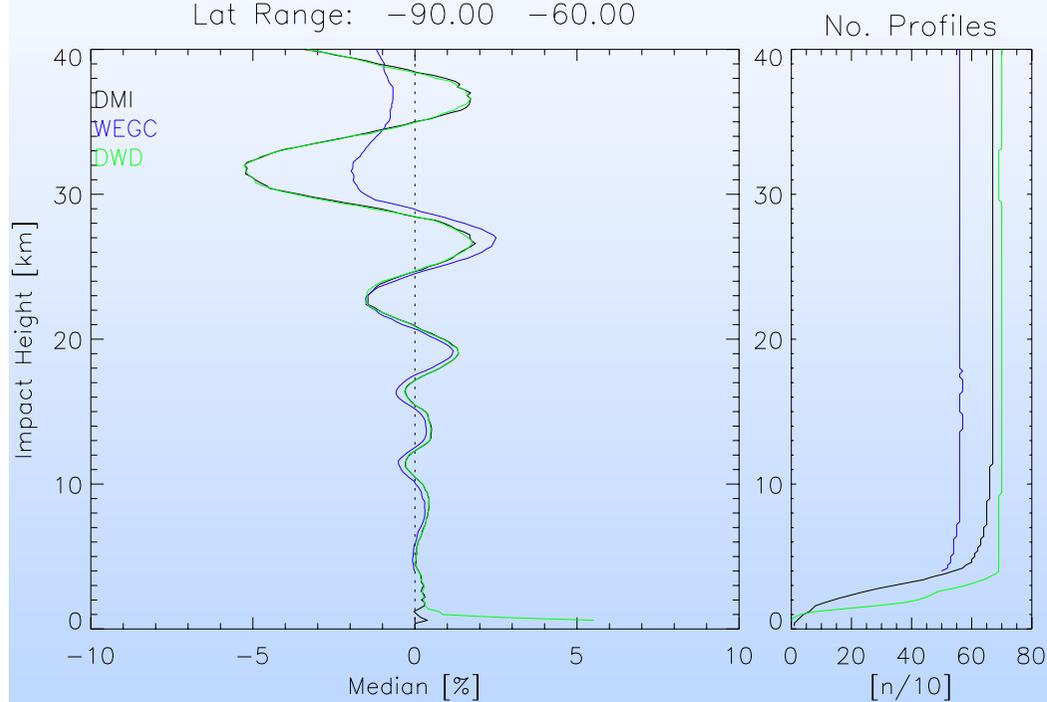


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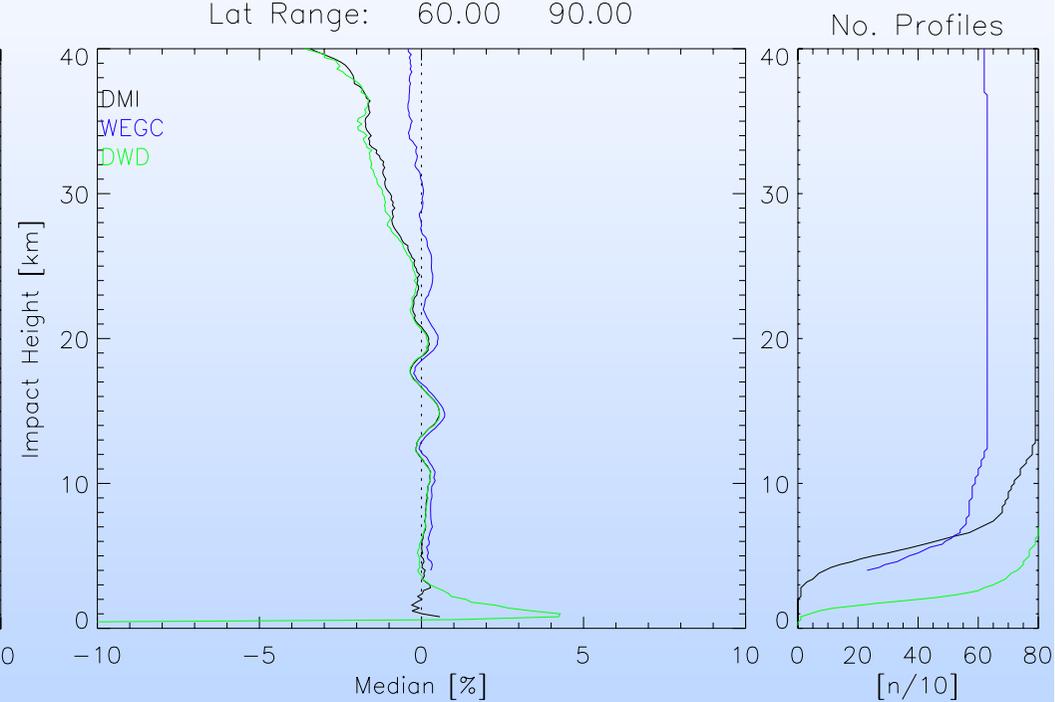


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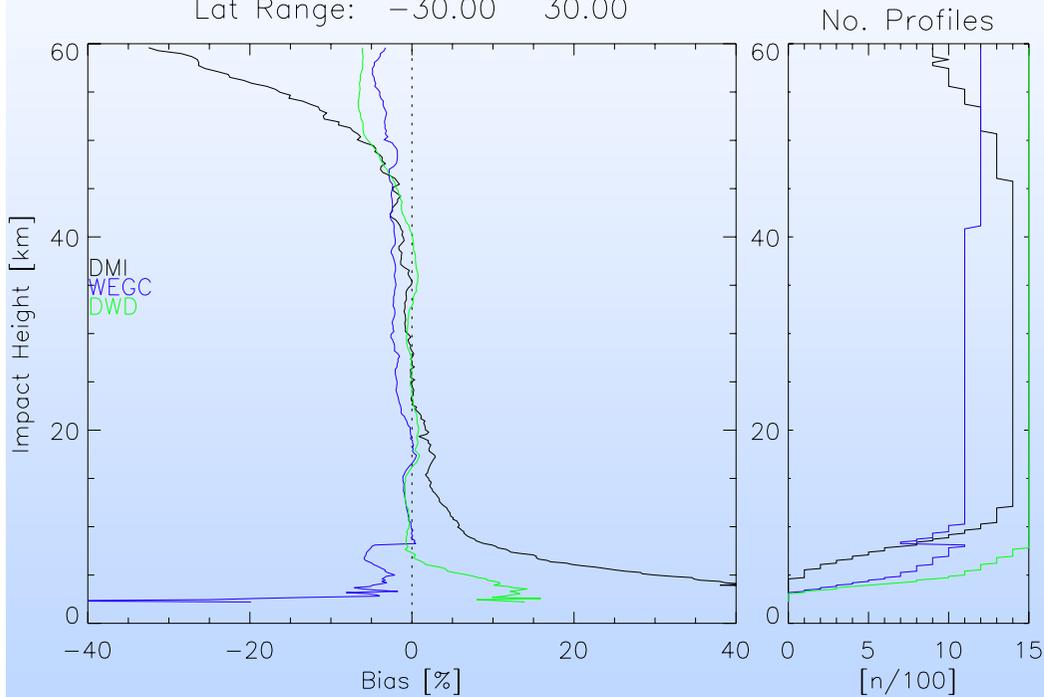


Refractivity DWDwrt DMI -WEGC-DWD 7 2005
No. Profiles: 794- 639- 813
Lat Range: 60.00 90.00

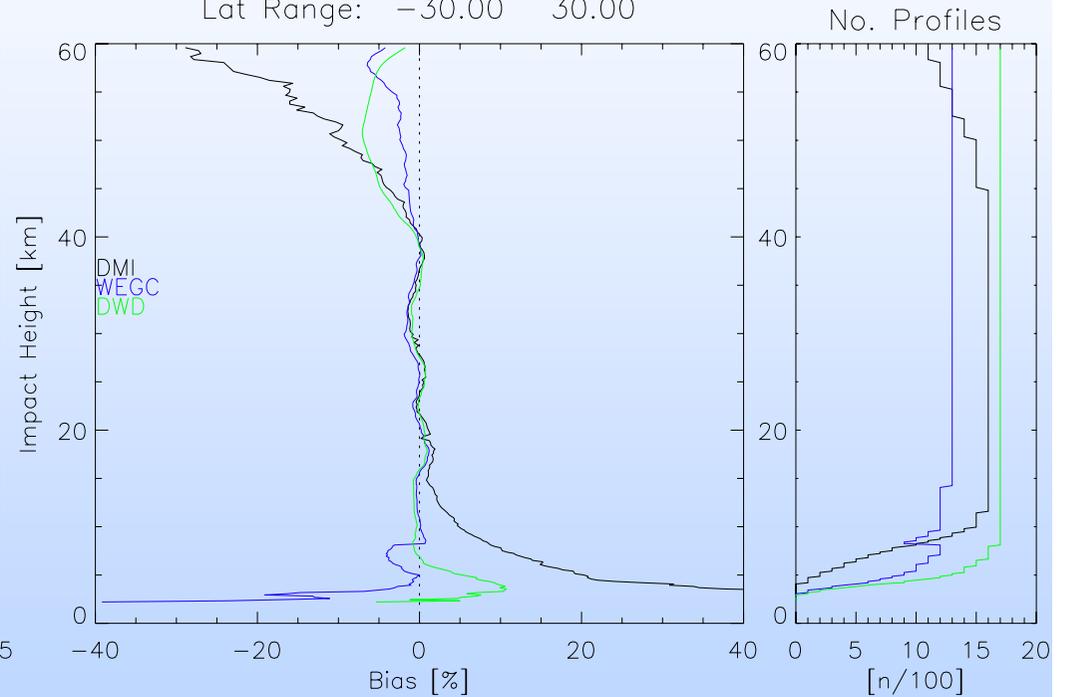


Bending Angle Bias

Bending Angle DWD wrt DMI-WEGC-DWD 1 2005
No. Profiles: 1493-1220-1581
Lat Range: -30.00 30.00



Bending Angle DWD wrt DMI-WEGC-DWD 7 2005
No. Profiles: 1669-1356-1745
Lat Range: -30.00 30.00

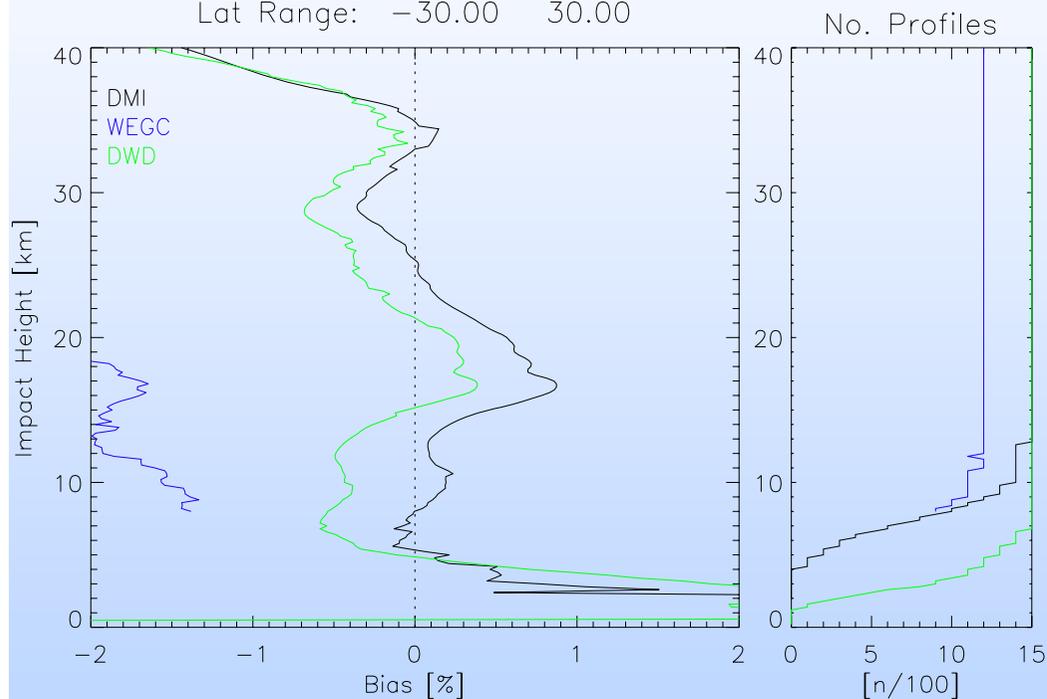


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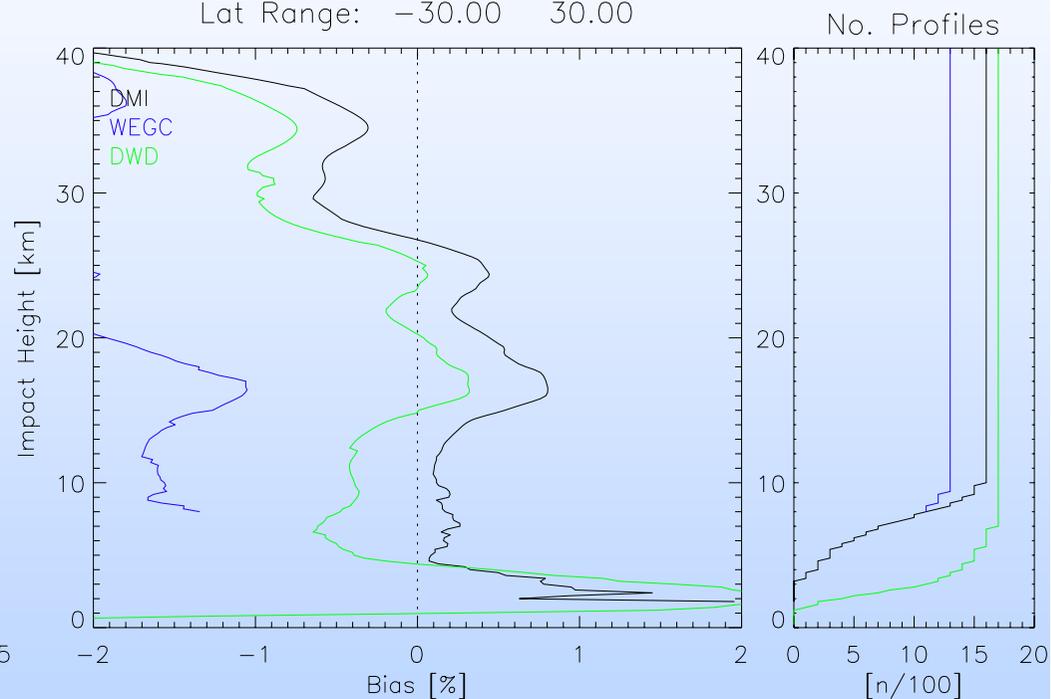


Refractivity Bias

Refractivity DWD wrt DMI -WEGC-DWD 1 2005
No. Profiles: 1508-1230-1585
Lat Range: -30.00 30.00

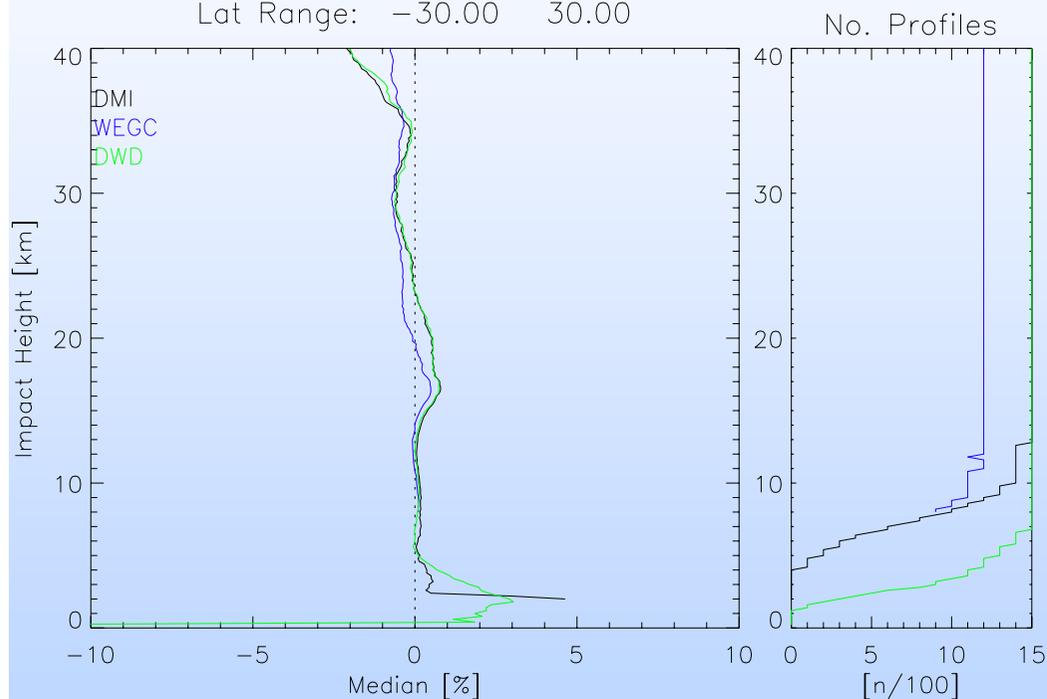


Refractivity DWD wrt DMI -WEGC-DWD 7 2005
No. Profiles: 1679-1380-1745
Lat Range: -30.00 30.00

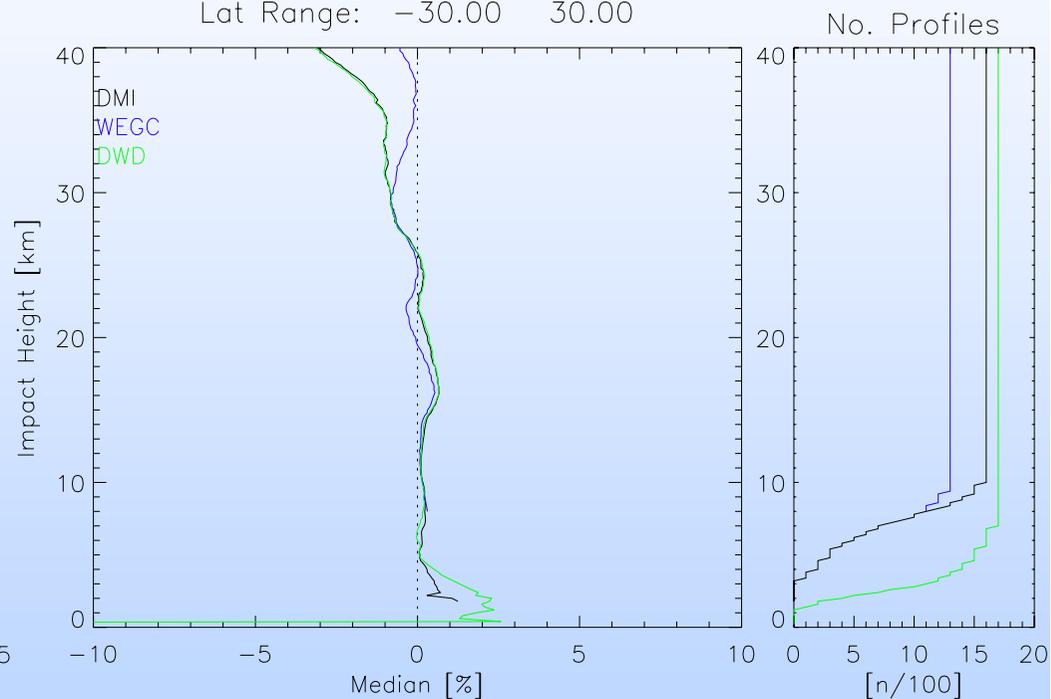


Refractivity Median

Refractivity DWDwrt DMI -WEGC-DWD 1 2005
No. Profiles: 1508-1230-1585
Lat Range: -30.00 30.00



Refractivity DWDwrt DMI -WEGC-DWD 7 2005
No. Profiles: 1679-1380-1745
Lat Range: -30.00 30.00



Conclusion

We are doing reasonably well!

But there is still need for improvement!

DMI vs. DWD shows good agreement

Median shows better agreement (Outliers)

Need for careful initialization & filtering

WEGC quality control rejects too many Profiles

