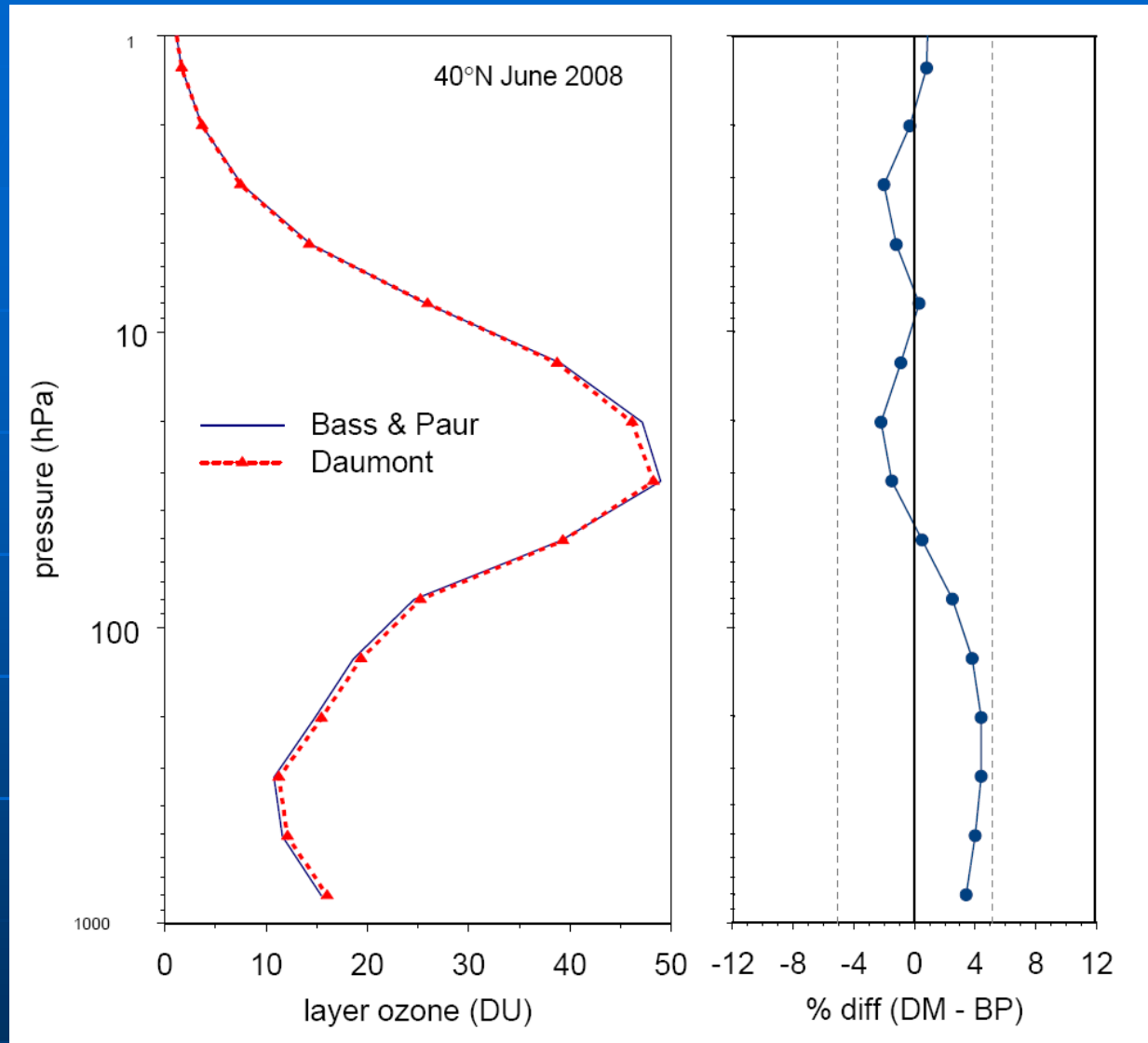


The effect of new ozone cross sections on TOMS total ozone and SBUV/2 ozone profile retrievals

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*GAW/IGACO workshop on ozone cross sections
Geneva, Switzerland May 11-13, 2009*



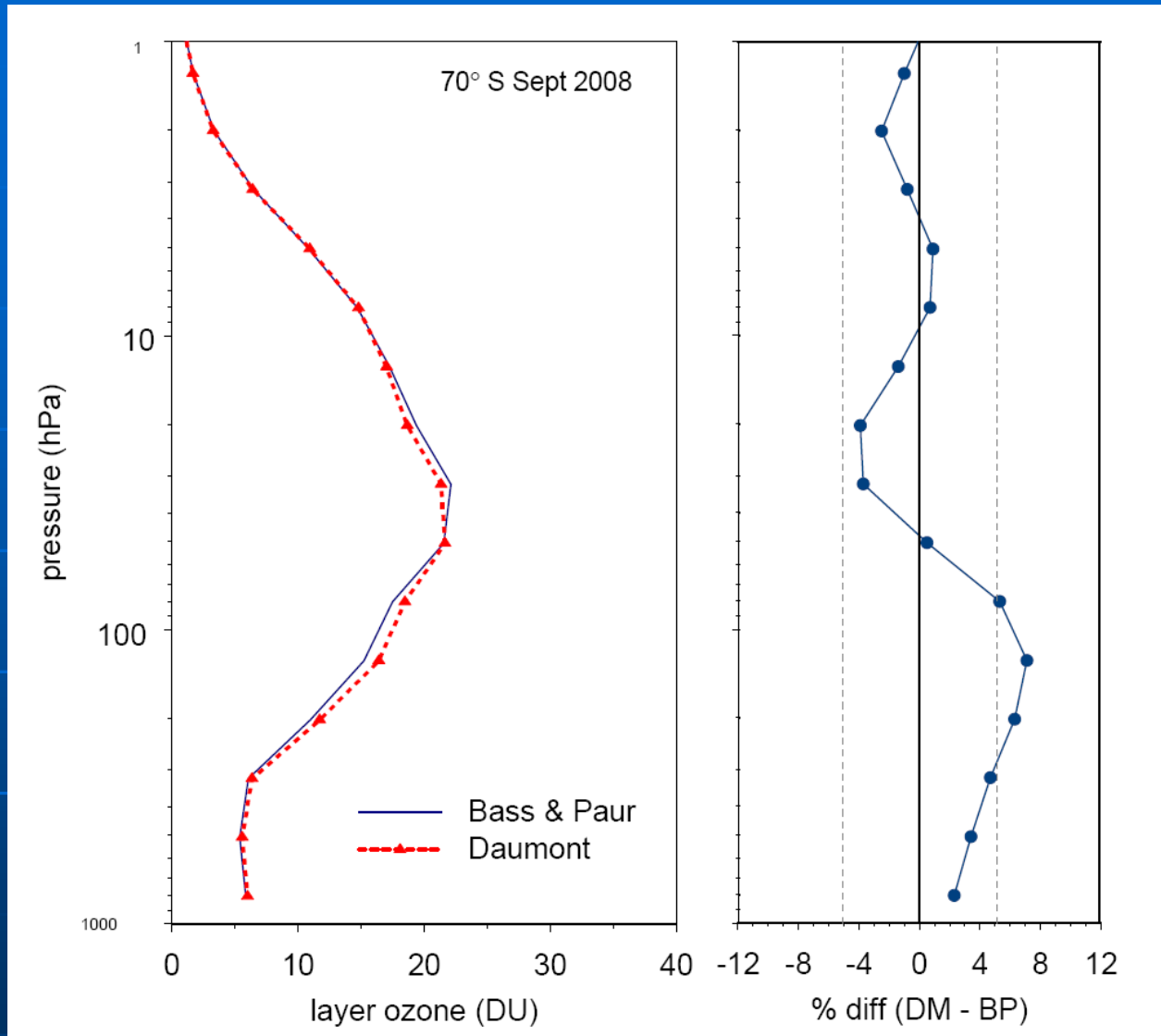
SBUV profile retrieval using Daumont cross sections produces lower ozone near the peak and larger ozone in the troposphere.

SBUV ozone cross sections

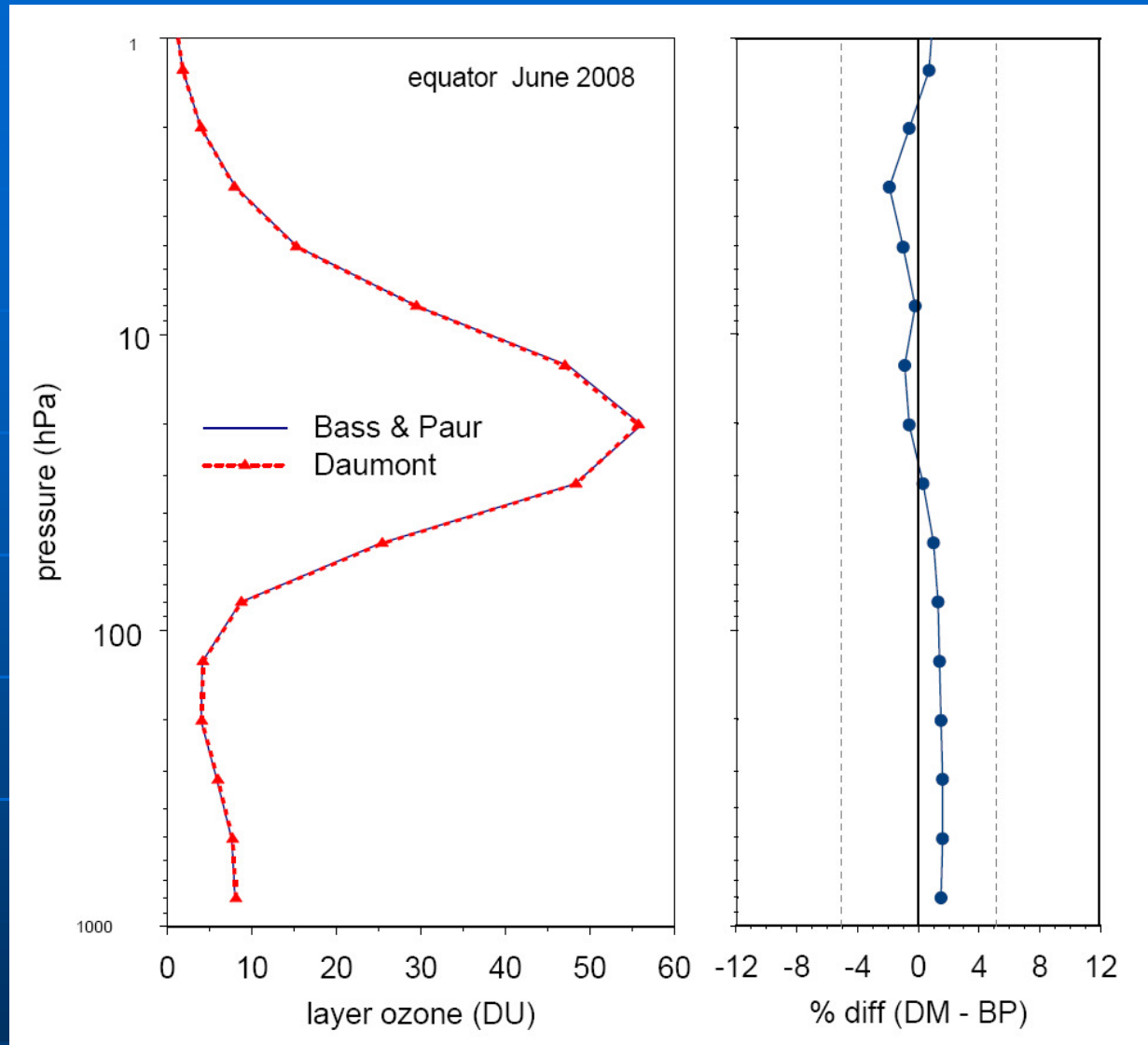
wavelength	Bass & Paur	Daumont	% diff
255.65	309.8	304.9	-1.6%
273.61	169.8	169.3	-0.3%
283.10	79.78	79.49	-0.4%
287.70	48.31	48.61	+0.6%
292.29	27.77	27.91	+0.5%
297.59	13.63	13.76	+1.0%
301.97	7.346	7.384	+0.5%
305.87	4.247	4.239	-0.2%
312.56	1.804	1.794	-0.6%
317.56	0.9678	0.9532	-1.5%
331.26	0.1668	0.1642	-1.5%
339.89	0.0366	0.0366	+0.0%



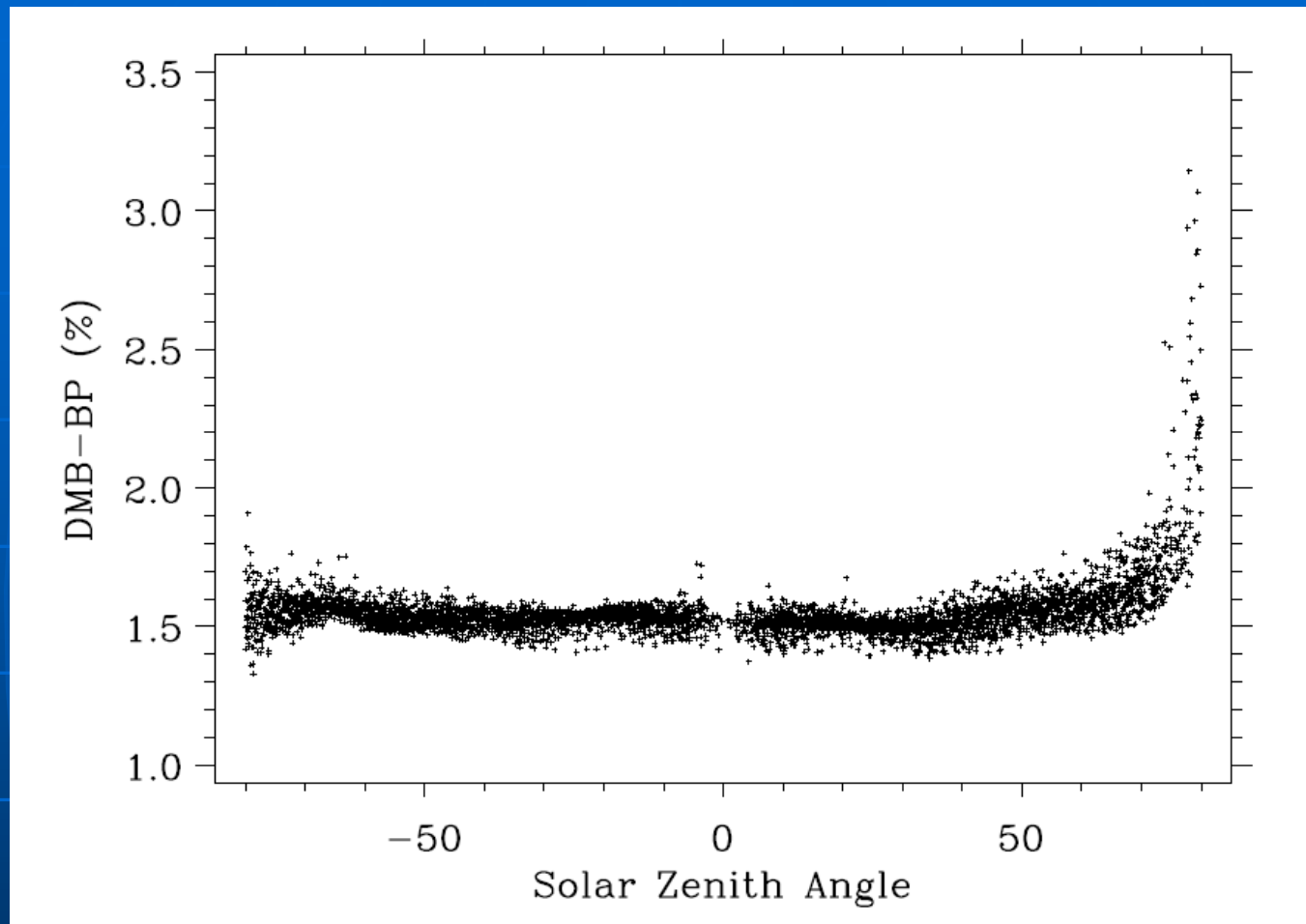
Note: includes altitude dependent temperature



The largest differences are seen at high latitudes in the troposphere.



The smallest differences are seen near the equator.



Effect of using Daumont cross sections on TOMS retrieval for data from March 21, 1979. Average offset +1.5%. Differences largest for high ozone and high solar zenith angles.

Earth Probe TOMS ozone cross sections

wavelength	Bass & Paur	Daumont	% diff
308.65	2.965	2.964	+0.0%
312.56	1.644	1.634	-0.6%
317.57	0.8752	0.8640	-1.3%
322.37	0.4808	0.4762	-1.0%
331.29	0.1410	0.1395	-1.1%
360.40	-	-	-



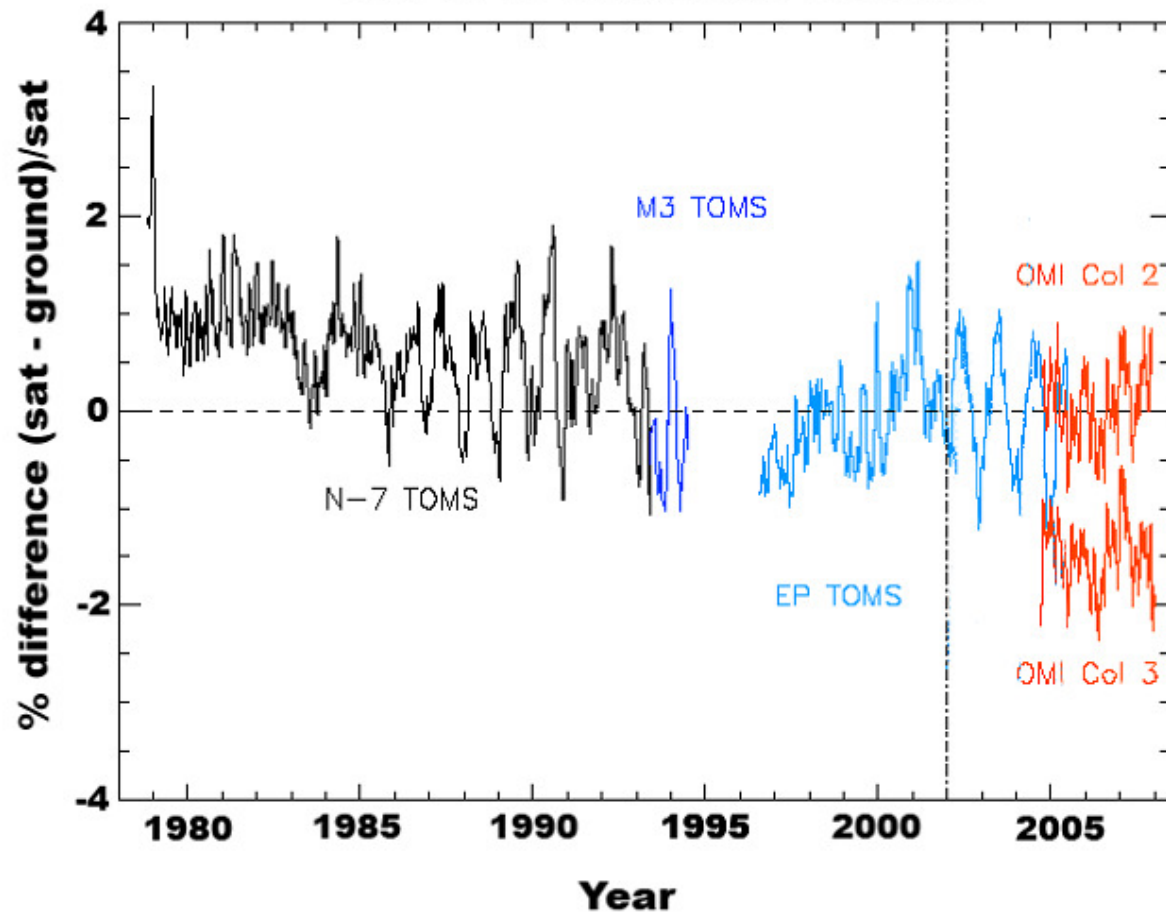
Note: $T = -45^{\circ} C$

Earth Probe TOMS ozone cross sections

wavelength	Bass & Paur	Daumont	% diff
308.65	2.965	2.964	+0.0%
312.56	1.644	1.634	-0.6%
317.57	0.8752	0.8640	-1.3%
322.37	0.4808	0.4762	-1.0%
331.29	0.1410	0.1395	-1.1%
360.40	-	-	-
B pair	0.7342	0.7245	-1.3%

Note: $T = -45^{\circ} C$

OMI vs 30 NH ground stations



DMB would increase OMI ozone ~1.3%

Conclusion

- Our current plan is to use Daumont cross sections for version 9 TOMS and SBUV processing
 - Absolute change is not large but...
 - Bass and Paur temperature dependence is clearly in error
 - TOMS and SBUV use climatological temperature profiles
- Total column ozone will increase 1% to 1.5%
- Profile ozone expected to decrease a few percent on the middle stratosphere and increase in lower stratosphere / troposphere.