



GALEX Diffuse UV Background

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ABSTRACT

We report preliminary investigation of the character of the diffuse ultraviolet background radiation as it is detected using the two ultraviolet cameras on GALEX. The bulk of the signal in most GALEX images is diffuse background, not point sources or galaxies. This diffuse radiation originates in a plethora of sources, including airglow/geophysical effects, zodiacal light (in the longer-wavelength of the two GALEX cameras), ultraviolet starlight scattered from interstellar dust, and additional radiation of unclear origin. Our Guest Investigator programs are just beginning - in this poster paper we concentrate on our examination of the publicly available Deep Imaging Survey targets. Our Guest Investigator targets have been carefully chosen to allow testing of the idea that part of the detected signal may be due to redshifted recombination radiation from the intergalactic medium.

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Celestial Regions photographed using NASA's GALEX ultraviolet cameras

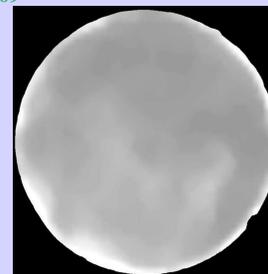
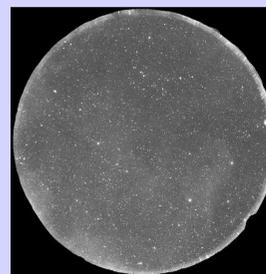
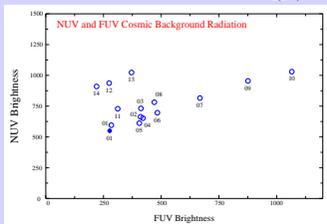
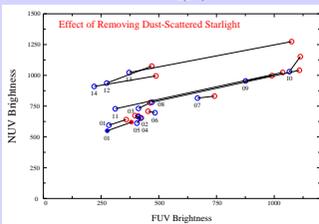
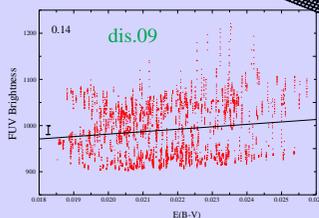
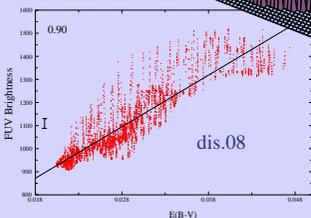
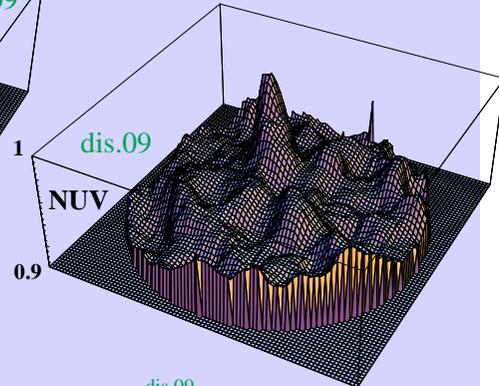
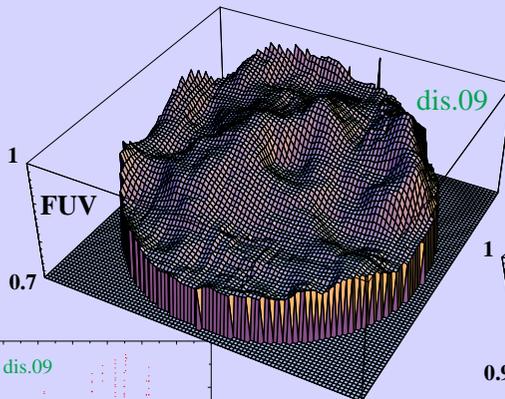
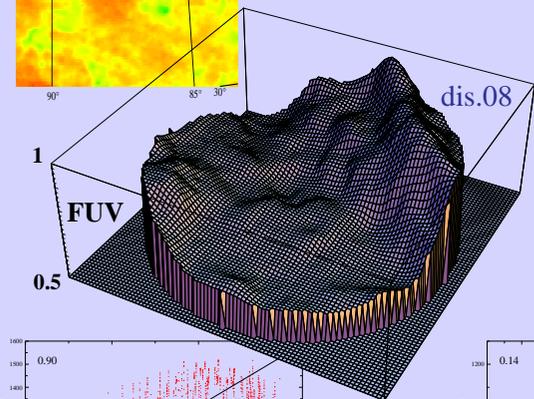
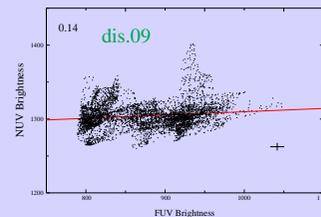
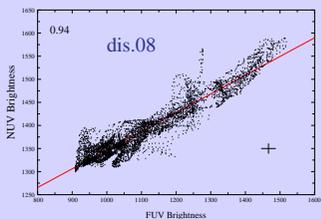
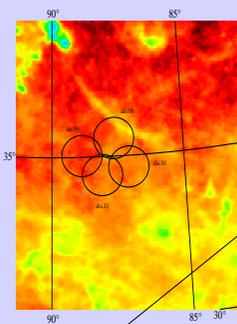
#	Name	RA & Dec	l & b	Al	E _{UV}	FUV mean	FUV intercept	FUV ratio	NUV mean	NUV intercept	ratio	CC
Tar-01	-	0.90 -42.75 331.80	-71.60 13420	0.011	382	277	0.73	970	909	0.89	0.68	
Dis-01	ELAISS1_01	9.32 -42.97 312.36	-73.90 15701	0.008	359	284	0.79	891	945	0.93	0.24	
Dis-02	ELAISS1_00	9.64 -43.99 310.89	-72.94 16163	0.007	411	411	1.00	1020	1014	0.99	0.64	
Dis-03	ELAISS1_07	10.36 -42.25 310.03	-74.74 5047	0.012	462	412	0.89	1128	1081	0.94	0.05	
Dis-04	ELAISS1_02	11.08 -43.85 307.41	-73.22 6032	0.008	397	421	1.06	1023	1003	0.97	0.51	
Dis-05	CDFS_01	52.01 -28.21 224.04	-55.47 31976	0.009	424	405	0.96	1004	962	0.94	0.27	
Dis-06	CDFS_00	53.13 -27.87 222.70	-54.44 44668	0.008	454	483	1.06	1050	1046	0.98	0.17	
Dis-07	ELAISN1_00	243.41 54.98 84.73	44.27 7899	0.008	741	668	0.90	1181	1165	0.98	0.12	
Dis-08	SIRTFEL_03	258.33 58.87 87.64	33.55 5558	0.029	1109	470	0.42	1391	1132	0.75	0.79	
Dis-09	SIRTFEL_00	259.13 59.91 88.86	33.04 23765	0.022	909	876	0.89	1348	1305	0.96	0.14	
Dis-10	SIRTFEL_02	260.11 58.50 87.10	34.66 2803	0.028	1113	1066	0.96	1502	1380	0.89	0.16	
Dis-11	SIRTFEL_01	260.42 59.34 88.10	34.44 23591	0.027	1037	312	0.30	1374	1079	0.71	0.48	
Dis-12	CFHTLSD4	333.78 -17.94 38.92	-52.91 20080	0.027	470	274	0.58	1425	1287	0.87	0.31	
Dis-13	VVDS22H	334.43 0.67 63.55	-43.77 14847	0.062	1075	371	0.35	1624	1373	0.80	0.57	
Dis-14	UVE_A2670	358.54 -10.40 81.33	-68.51 6876	0.037	488	220	0.45	1345	1259	0.91	0.40	

Conclusion: There is a strong correlation (0.94) between the FUV and NUV images of dis.08, but NOT dis.09 (0.14): see the Mathematica dis.09 FUV and NUV images below! And, there is no correlation of the dis.09 brightness with E(B-V) (see plot). So, we can firmly conclude that the diffuse UV background at dis.09 (and at many other locations; see table) is NOT due to starlight that is scattering from interstellar dust. We hope our planned future observations will reveal the origin of this radiation.

Above: a list of the images we have analysed, including our own first target, "Tar.01" The result of the analysis of all of these images is given in the two plots at the bottom of the poster, showing the effect of removal of radiation we identify as dust-scattered starlight. A surprising residual remains, and is of unknown origin.

In this poster, we show details of two targets (color in the table above), one (dis.08) that is dominated by dust-scattered starlight, and one (dis.09) that appears to be largely free of dust-scattered starlight. We use the GALEX pipeline processor sky background image in our analysis. That it preserves the diffuse radiation very well is shown in the two dis.09 images (before and after point source removal) that are shown in the bottom right of the poster. The diffuse radiation is very visible!

The Schlegel, Finkbeiner, & Davis dust map for four targets (including dis.08 and dis.09) appears to the left. Note the ridge of dust in dis.08! That ridge appears in the Mathematica 3-d plot of the GALEX FUV image (inner '1' only) just below the map. And, below that, is the strong (0.90) correlation of FUV flux with E(B-V).



Heartfelt thanks to the superb GALEX team for a great pipeline background measure!