Pattern similarity across planetary dune fields

Mackenzie Day[1,2], Gary Kocurek[1]

[1]*Jackson School of Geosciences, Department of Geological Sciences, University of Texas at Austin, Austin, TX 78712*

[2]*Department of Earth, Planetary, and Space Sciences, UCLA, Los Angeles, CA 90095*

SUPPLEMENTARY MATERIAL

Contained within this supplementary document are the names, locations, and measured spacings of dune fields plotted in Figure 2 the main text (Table 1). Notable references discussing the dune field or desert are also given. The measured dune field spacing ranges from 25 m in the Registan Desert to 4.2 km in the Taklimakan Desert. Destabilized sand forming dunes on a flat bed initially forms dunes with spacings of ~20 m (Elbelrhiti et al., 2005), thus the range of spacings presented in Table 1 is comprehensive for the range of dune spacings on Earth.

Dune fields on Mars and Titan were also included in this study and were measured using High Resolution Imaging Science Experiment and Cassini Radar images, respectively (Table 2).

Table 1. Study locations on Earth and notable references – mean spacing ± 1σ

Location	Center coordinates of study area	Dune type	Spacing (m)	Previous research on the study area
Reworked fan deposit – Pakistan	29.07° N, 065.22° E	Crescentic	25 ± 5	--
Coastal Peru – Peru	11.63° S, 077.17° W	Crescentic	58 ± 14	--
Guerrero Negro Dune Field – Mexico	27.98° N, 114.15° W	Crescentic	68 ± 13	Inman et al., 1966; Fryberger et al., 1990
Coastal Somalia – Somalia	04.89° N, 047.94° E	Crescentic	141 ± 37	--
White Sands Dune Field – United States	32.81° N, 106.28° W	Crescentic	182 ± 43	McKee, 1966; Baitis et al., 2014
Tengger Desert – China	38.36° N, 102.98° E	Crescentic	307 ± 80	Ping et al., 2014
Erg Aoukar – Mauritania	18.19° N, 012.91° W	Crescentic	321 ± 72	Breed and Grow, 1979
Kyzylkum Desert – Kazakhstan	44.07° N, 065.12° E	Crescentic	514 ± 117	--
Grand Erg Oriental Desert – Tunisia	32.17° N, 009.23° E	Crescentic	1209 ± 296	Wilson, 1971; Breed and Grow, 1979
Kara-Kum Desert – Turkmenistan	39.17° N, 059.32° E	Crescentic	1345 ± 285	Maman et al., 2011
Greater Lake Chad – Chad	13.17° N, 016.21° E	Crescentic	1658 ± 359	Mauz and Felix-Henningsen, 2005
Erg Aoukar – Mauritania	17.96° N, 010.83° W	Crescentic	1988 ± 361	Breed and Grow, 1979
Thar Desert – Pakistan	27.25° N, 069.29° E	Crescentic	2072 ± 444	Kar, 1993; Singhvi and Kar, 2004
Rub' al Khali Desert – Saudi Arabia	22.38° N, 054.24° E	Crescentic	2800 ± 548	Goudie et al., 2000
Registan Desert – Afghanistan	30.80° N, 065.77° E	Crescentic	3558 ± 894	Whitney, 2007
Taklimakan Desert – China	39.80° N, 087.68° E	Crescentic	4264 ± 1241	Wang et al., 2002
Rice Valley – United States	33.95° N, 114.77° W	Linear	154 ± 32	Zimbelman et al., 1995
Tanami Desert – Australia	20.21° S, 131.49° E	Linear	266 ± 112	Wasson et al., 1988
Kalahari Desert – Namibia	24.55° S, 019.17° E	Linear	566 ± 187	Bullard et al., 1995; Thomas and Burrough, 2012, 2016
Simpson Desert – Australia	25.15° S, 135.03° E	Linear	675 ± 205	Folk, 1971
Great Victoria Desert – Australia	27.39° S, 129.69° E	Linear	685 ± 196	Pell et al., 1999
Erg Amoukrouz – Mauritania	17.69° N, 014.91° W	Linear	1124 ± 249	Breed and Grow, 1979; Mainguet et al., 2008
Great Sandy Desert – Australia	21.68° S, 122.97° E	Linear	1299 ± 411	Crowe, 1975
Erg Ouarane – Mauritania	21.21° N, 009.59° W	Linear	1759 ± 344	Breed and Grow, 1979; Besler 2008
Rub' al Khali Desert – Yemen	17.98° N, 048.40° E	Linear	2297 ± 364	Breed and Grow, 1979
Namib Sand Sea – Namibia	24.25° S, 015.17° E	Linear	2410 ± 397	Lancaster, 1989; Bristow et al., 2007
Grand Erg Oriental – Algeria	29.25° N, 004.75° E	Linear	4012 ± 1124	Wilson, 1971; Breed et al., 1979

Table 2. Study locations on Mars and Titan and notable references – mean spacing ± 1σ

Location	Center coordinates of study area	Dune type	Spacing (m)	Reference
Chasma Boreal – Mars	84.76° N, 000.00° E	Crescentic	238 ± 75	Schatz et al., 2006
Siton Undae – Mars	72.53° N, 054.30° W	Crescentic	255 ± 62	Bishop, 2007
Lopez crater – Mars	14.54° S, 097.66° E	Crescentic	323 ± 62	Zimbelman and Johnson, 2016
Fensal Sand Sea – Titan	10° N, 050° W	Linear	2571 ± 405	Radebaugh et al., 2008
Fensal Sand Sea – Titan	06° S, 040° W	Linear	4086 ± 744	Radebaugh et al., 2010

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