DATA REPOSITORY 2001112

SAMPLING AND EXPERIMENTAL METHODS

Over six hundred 2.54 cm cores were collected at 18 sites in the Portilla Formation and 41 sites in the Santa Lucia Formation in the southern zone of the Cantabria-Asturias arc. The two Devonian formations sampled have previously revealed well-behaved paleomagnetic results, and show little or no evidence of penetrative strain (Van der Voo et al., 1997). Oriented samples were collected in the field using a portable gasoline-powered drill and a magnetic compass.

Between eight and 12 standard paleomagnetic cores from each site were progressively demagnetized in an Analytical Service Co. (ASC) thermal demagnetizer and measured with a 3-axes Cryogenic 2G magnetometer in the field-free room at the University of Michigan paleomagnetic laboratory. The paleomagnetic behavior of these particular Devonian limestones is well known from previous studies (Van der Voo et al., 1997; Weil et al., 2000); consequently, thermal demagnetization was chosen over AF demagnetization. Characteristic remanence directions were calculated from principal component analysis (Kirschvink, 1980) of linear demagnetization vectors picked from paleomagnetic orthogonal projection plots (Zijderveld, 1967). The results from demagnetization are presented in Table 1. Summary of structurally corrected site information is presented in Table 2. Details of the rock magnetic properties of the carbonates sampled in this study are discussed in Weil and Van der Voo (in press).

Individual site means were calculated using the method of Fisher (1953). McElhinny (1964) and inclination fold tests (McFadden and Reid, 1982) were used to identify the age of magnetization components with respect to folding.

APPENDIX FIGURE CAPTIONS

Figure Appendix 1. Typical examples of orthogonal thermal demagnetization plots (Zijderveld, 1967) in *in situ* coordinates from 9 Devonian limestone samples from Portilla and Santa Lucia Formations. Open (closed) symbols represent projections onto vertical (horizontal) plane; demagnetization temperatures given in degrees Celsius. A: Bodon unit. B: Pedrosa synclinorium. C: Northern limb of Alba synclinorium. D: Southern limb of Alba synclinorium.

Figure Appendix 2. Schematic geologic map of southern arm of Cantabria-Asturias arc. Paleomagnetic site locations are shown as dark gray stars.

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Table 1: Paleomagnetic and structural site information and statistical parameters.

Sites	Tectonic Corrections Strike	OT Dip	Dip	Uncorrected Site Mean Dec - Low Temp	Inc - Low Temp	α95	K	Dec - High Temp	Inc - High Temp	α 95	K
Bodon Unit											
SL55	83		60	73	11	6	140				
SL102‡	86	118	62	72	11	14	23				
SL103‡	28	94	86	73	-6	13	21				
SL104	216		60	96	-14	8	57				
SL105	246		39	62	-4	8	58				
SL106	96		54	57	-18	14	22				
SL107	67		41	65	5	12	32				
SL108	280		45	90	20	8	43				
SL120	104		59	73	-6	8	52				
SL121	223		43	(147	-29)	21	14				
Pedrosa Synclinorium											
PL25‡	90	100	80	142	-27	8	62				
SL25‡	123	131	49	144	-19	5	218				
SL26‡	94	132	48	138	-26	3	376				
SL27	90		75	138	-33	4	198				
SL28	271		42	152	-42	10	47				
SL29‡	88	92	88	148	-33	8	234				
SL32‡	108	111	69	148	-13	4	332				
SL33‡	91	114	66	137	-19	5	143				
SL34‡	107	95	85	150	-24	7	64				
SL35	238		46	155	-27	7	50				
SL36	78		70	163	-9	3	685				
SL37	278		85	154	-23	7	101				
SL50	260		51	138	-26	15	21				
SL53	114		51	156	-26	11	31				
SL54	237		53	153	-28	6	113				
SL100	287		59	137	-20	12	44				
SL101	86		84	126	-21	13	20				
SL109	308		45	146	-24	3	309				
SL110‡	138	133	47	148	-19	11	41				
SL111	354		35	148	-27	6	126				
SL112	166		42	159	-29	5	106				
SL113‡	33	159	21	152	-23	9	46				
SL114	276		64	145	-7	10	41				
Alba Synclinorium											
Northern Limb											
PL24‡	83	97	83					64	-32	3	586
PL40	91		90	60	-6	4	341	47	-19	5	153
PL41	279		72					78	-26	3	479
PL42*	267		57								
PL43#	109		55	85	-24	13	19	32	-22	11	27
PL44#	71		38	102	-24	16	12	85	-28	7	54
PL45#	95		62	60	-9	12	31	40	-27	7	57
PL46#	112		64	71	-26	13	24	41	-36	8	41
PL47#	75		68	72	-7	5	184	51	-21	6	92
PL48	274		68					98	27	6	163
PL100	116		21					54	-6	13	24

PL101	22	46					350	-2	4	249
PL102	74	32					78	-31	6	75
PL106	89	27					61	-32	29	4
SL115*	85	73								
Sl116*	73	15								
Southern Limb										
PL103	335	44	157	-30	6	99				
PL104	295	44	144	-12	10	34				
PL105	325	47	158	-4	6	96				
SL30	278	49	138	-20	6	118				
SL31*	317	58								
SL52	308	71	148	-13	16	35				
SL117	316	56	154	-1	8	99				
SL118*	344	44								
SL119	306	45	161	-2	8	60				
SL122*	296	60								

‡ Designates overturned bedding

* Designates a site that could not be used (explained in text)

Designates a site that required Hoffman Day (1978) analysis.

(Dec, Inc) Represents paleomagnetic data not used in analysis (explained in text)

Table 2: Summary of structurally corrected site information.

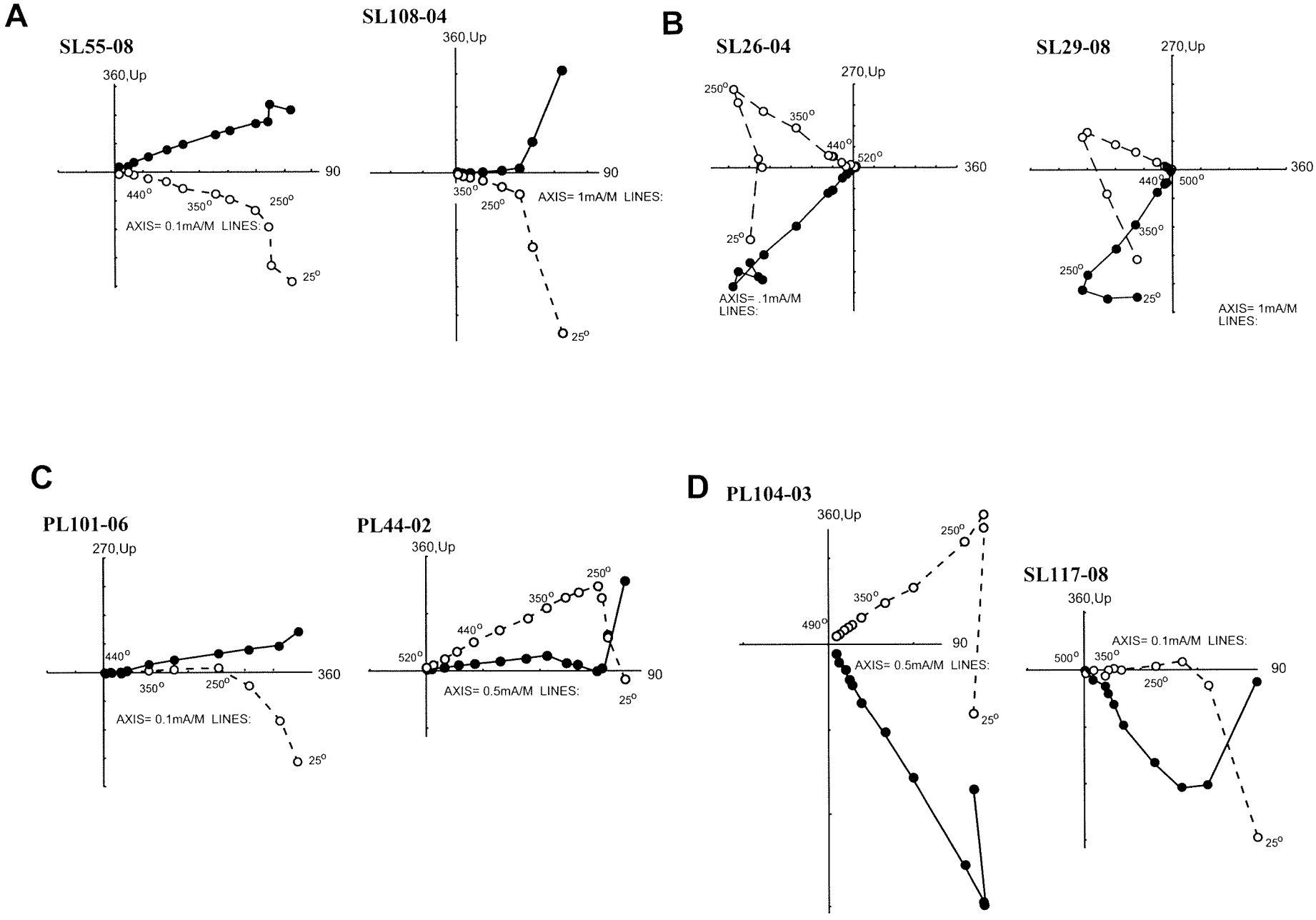
	Tectonic Corrections			Structural Correction Axes			Corrected Site Mean	
Sites	**Strike**	**OT Dip**	**Dip**	**Trend**	**Plunge**	**Angle**	**Dec**	**Inc**
Bodon Unit								
SL55	83		60	315	83	75	147	-2
SL102‡	86	118	62	11	82	80	150	21
SL103‡	28	94	86	11	82	80	152	4
SL104	216		60	11	82	58	153	-7
SL105	246		39	305	86	91	153	-2
SL106	96		54	305	86	90	145	-16
SL107	67		41	305	86	90	155	7
SL108	280		45	305	86	64	155	20
SL120	104		59	315	83	75	147	-2
Alba Synclinorium								
PL24‡	83	97	83	62	69	88	156	-10
PL40L	91		90	56	70	93	146	16
PL40H#	91		90	53	68	109	154	7
PL41	279		72	62	69	76	154	-5
PL43L	109		55	56	70	66	150	-4
PL43H#	109		55	52	64	119	150	7
PL44L	71		38	56	70	55	156	-7
PL44H#	71		38	54	66	81	160	-1
PL45L	95		62	56	70	92	148	12
PL45H#	95		62	52	67	117	158	2
PL46L	112		64	56	70	81	153	-5
PL46H#	112		64	53	67	102	150	-9
PL47L	75		68	56	70	83	150	14
PL47H#	75		68	53	67	104	153	6
PL48 #	274		68	249	60	55	151	5
PL100	116		21	62	69	107	155	17
PL101	22		46	62	69	167	155	6
PL102	74		32	62	69	72	152	-11
PL106	89		27	62	69	89	154	-11

‡ Designates overturned bedding

L, H - Designates the Low or High temperature component from a given site.

Designates a site that required two stages of structural correction (structural axes given as total combined rotation axes).

Appendix Figure 1



Appendix Figure 2