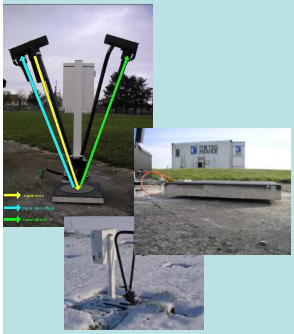
State of the ground and snow depth measurement by SOLIA 300 (sensor from Degréane)

eration principle



he intensity of the emited signal is onstant or reguled. The diagnostic epends of the reflected and ackscattered signals intensity. The ference surface is a black concrete ate layed on the ground.

If reflected and backscattered signals are weak, the ground is dry, On the countrary, if reflected and backscattered signals are high, the ground is covered by snow. Between these two possibilitys, we find differents states of the ground : wet, moist, watery, frosted, ….The diagnostic is improved by the temperatures of ground plate. Hereafter, on the table, the differents diagnostics positions relatives to the signals intensity.

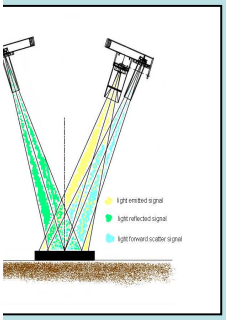
Intensity of backscattered signal

	NEI (snow)		
NEP (Partially covered with snow) SGB (White frost) case 12	NEP (Partially covered with snow)	NEI (snow)	NEI (snow)
SEC (dry)	SHU (wet) / NEP (Partially covered with snow)	SHU (wet) / NEP (Partially covered with snow)	SHU (wet) / SVG (icy)
SHU / "///" (wet /"///")	SHU (wet) / SVG (icy)	SHU (wet) / SVG (icy)	SHU (wet) / SVG (icy)
SHU / "///" (wet /"///")	SHU (wet) / SVG (icy)	SHU (wet) / SVG (icy)	SMM (covered with water) / SVG (icy)

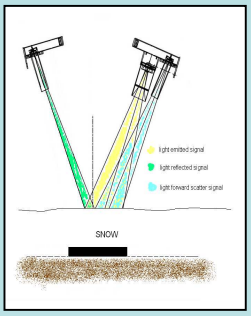
Intensity of reflected signal

differents diagnostics value of intensity signals and temperature of the reference plate ground

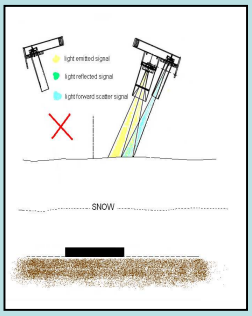
0 : dry, 1/2 : wet/watery, 4 : covered by frost, 5 : covered by glass, 7 : partialy covered by snow, 8 : totaly covered by snow



ry ground, distance is aximum, The signals are eflected and backscattered n a maximum surface



Snowed ground, the distance is decreasing, signals are reflected and backscattered on a smaler surface



Snowed ground, the distance is smaler, the reflected signal is now null and the backscattered signal corrects (counterbalances) the diminution of scattered surface by the increase of the intensity signal caused by the decrease of the distance still smaller.

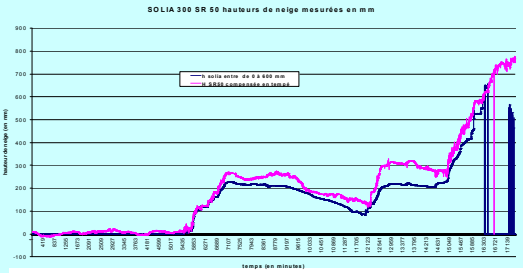
Col de Porte winter 2007/2008 SOLIA300 (Degréane) et SR50 (Campbell)

Col de Porte winter 2007/2008 SOLIA300 (Degréane) … buried under the snow …

results

	0	1	2	4	5	7	8	somme
0	92,9%	4,4%	0,0%	2,6%	0,0%	0,1%	0,0%	64133
1	21,0%	72,7%	4,6%	0,4%	1,1%	0,0%	0,0%	48791
2	0,2%	4,8%	94,9%	0,0%	0,0%	0,1%	0,0%	7254
4	2,7%	10,3%	0,0%	78,3%	8,5%	0,1%	0,0%	1431
5	1,5%	12,4%	1,2%	17,2%	66,9%	0,7%	0,0%	2026
7	61,5%	0,0%	0,0%	3,5%	0,0%	31,9%	3,1%	1045
8	0,1%	0,0%	0,0%	0,0%	0,0%	0,0%	99,9%	951
99	100,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	1
omme	70554	39041	9165	3361	2066	445	1000	125632

Correlation table between two close and identical sensors with differents state of the ground



Height of sonw in Col de Porte winter 2007/2008 with two differents sensors : SOLIA300 (Degréane) and SR50 (Campbell)

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