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Comparison of SPECTRAL EVOLUTION PSR-3500 vs. ASD FieldSpec 3 series Spectroradiometers

SUPERIOR SIGNAL TO NOISE AND SPECTRAL RESOLUTION - The PSR-3500 has the best combination of spectral resolution and NER values, particularly in the near infrared ranges. For best sensitivity, only SPECTRAL EVOLUTION spectroradiometers can be used with direct attachment FOV lenses that couple directly to the optical path. This is due to its superior diffraction-based optical platform with 3 discrete photodiode arrays (two InGaAs arrays for NIR) for each of the 3 separate spectrometer ranges. Our system requires no light-robbing internal optical fiber to mesh all 3 detectors into the signal path. The ASD FieldSpec 3 series uses a permanently mounted trifurcated fiber optic cable which puts practical limits on sensitivity vs. spectral resolution. These trifurcated cables can break during use, requiring the user to send the unit back to ASD in Colorado for a costly repair. SPECTRAL EVOLUTION spectrometers have no internal fiber optics or movable gratings that can break, drift or fail during mission critical field expeditions. SPECTRAL EVOLUTION spectroradiometers can also be supplied with an external fiber optic cable (either permanently mounted or removable) as well as other accessories such as right angle diffusers or integrating spheres.

PORTABLE SPECTRORADIOMETER SPECIFICATION COMPARISONS		
SPECTRAL EVOLUTION PSR-3500		ASD FIELD SPEC 3
(fiber optic)	(4° FOV lens)	(fiber optic)
SPECTRAL RESOLUTION (in nm)		
≤3 nm @ (350-1000 nm)	≤3 nm @ (350-1000 nm)	3 nm @ 700 nm
≤9 nm @ 1500 nm	≤9 nm @ 1500 nm	10 nm @ 1400 nm
≤6.5 nm @ 2100 nm	≤6.5 nm @ 2100 nm	10 nm @ 2100 nm
NOISE EQUIVALENCE RADIANCE (in W/cm²/nm/sr)		
1.2 x 10 ⁻⁹ @ 400 nm	0.8 x 10 ⁻⁹ @ 400 nm	1.1 x 10 ⁻⁹ @ 700 nm
2.5 x 10 ⁻⁹ @ 1500 nm	1.2 x 10 ⁻⁹ @ 1500 nm	2.4 x 10 ⁻⁹ @ 1400 nm
2.5 x 10 ⁻⁹ @ 2100 nm	1.2 x 10 ⁻⁹ @ 2100 nm	4.7 x 10 ⁻⁹ @ 2100 nm

FLEXIBILITY– PSR-3500 can be ordered with either a laptop computer and/or a rugged IP-67-rated GETAC handheld personal digital assistant (PS236). For maximum convenience, the PSR-3500 can store up to 500 spectra and can take measurements without a computer– the ASD can't. Both systems communicate with and operate the spectrometer via wireless interfaces or with a wired USB cable on a personal computer. The handheld GETAC also features integral camera, GPS location, compass and altimeter capabilities and contains a high capacity Li-Ion battery that will provide >12 hours of continuous operation on a full charge. We provide our DARWin SP Data Acquisition Module software to run on a laptop computer- and a special version of the program to run on the GETAC's Windows CE Mobile operating system. For field use, the small handheld GETAC makes it very easy to monitor field data as it's being taken and can be used to trigger data collection. The ASD FieldSpec 3 series is only configured to work with a cumbersome laptop with requires the use of a bulky "bellyboard" to run the unit (see photo). The much smaller, lighter weight PSR-3500 is easier to use in the field with the GETAC PS236....or in stand-alone operation.



PS-236

LIGHTWEIGHT– Easy to carry. At less than 4 kilograms including battery, the PSR-3500 is a lighter instrument to carry in a backpack than the ASD FieldSpec 3 series (5kg not including the bulky NiMH batteries, computer or belly board.). The small, handheld GETAC PS236 PDA has a high quality display designed for viewing in bright sunlight and does not require the use of a cumbersome bellyboard. We also offer the waterproof TENBA SHOOTOUT Backpack, designed for extended hiking comfort and flexibility. SPECTRAL EVOLUTION spectrometers use integral slide-in high capacity, lightweight Lilon batteries for superior performance without the need for bulky lead acid batteries.

SPECTRAL EVOLUTION Portable Spectrometer (near right) with GETAC PS236 and backpack vs. ASD Portable Spectrometer with computer, bellyboard, reflectance probe and backpack (far right). The SPECTRAL EVOLUTION SYSTEM is much smaller, lighter and easier to use.



RELIABILITY & PERFORMANCE- SPECTRAL EVOLUTION PSR-3500 spectroradiometers are diffraction grating based with firmly attached optical components for reliability in field use. The entire NIR range is covered by two discrete 256 element InGaAs photodiode arrays, eliminating the need for moving gratings or prisms that can get stuck in the field or shift alignment. In comparison, ASD's instruments use two single element InGaAs detectors (not photodiode arrays) with moving diffraction gratings to cover the 1000-2500nm range. The 3 different spectrometer systems within the ASD machine are linked to the original light

light path with a fragile, permanently mounted trifurcated fiber optic cable that can get damaged with routine handling in the field. The use of a trifurcated cable means that the different detectors within the ASD unit are all seeing different parts of the target area. The three detectors within the SPECTRAL EVOLUTION PSR-3500 are all measuring the same target sample due to its beam splitter optical path. This also ensures better transition area data integrity as the spectrum shifts between the 3 detectors. The PSR-3500 does not require internal fiber optics that can be subject to breakage in field use. All SPECTRAL EVOLUTION Spectrometers come with a full 12 month warranty against defects and breakage in use.

FAST OPERATION– Auto-shutter, auto-exposure and auto-dark correction for one-touch operation. No lengthy set-up optimization is needed. The ASD instruments all require a time consuming, tedious optimization step to synchronize the detectors prior to use.



Unlike equivalent ASD models, SPECTRAL EVOLUTION Portable Spectroradiometers feature a lightweight slide-in Lilon battery for >3 hours of continuous use on a single charge. Each unit comes with two batteries and two AC chargers for >6 hours of continuous field use (extra batteries may also be ordered for added range). At ~7 lbs including battery, SPECTRAL EVOLUTION Portable Spectroradiometers can also be easily carried in the field with a shoulder strap (optional). Each unit contains internal memory to store up to 500 spectra, so it is not necessary to carry a personal computer or handheld PDA to operate the instrument. If desired, the unit can also be carried in a backpack (optional accessory).

