```
> restart;with(Riemann):with(TensorPack): with(Canon):CDF(0): CDS(index):
```

**Chapter XX Tensor analysis using indices - Senovilla et al. - Shearfree for acceleration parallel to vorticity if $\sigma_{a\,b}=0 \Rightarrow \omega\Theta=0$**

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**eq67**

```
> read "EFE" : read "SFE" :read "fids" :read "Seneqs80" :
```

proof of eq67:

```
> eq[67] := P[-a,-b]·omega[b, d,-D] =- 2·`p'`·theta·omega[a] / Psi : T(%);
```

$$P_{a\,b}\,\omega^{b\;\;d}{}_{;d} = -\frac{2\,p'\,\theta\,\omega^{\;a}}{\Psi} \tag{1.1}$$

proof: this is a simple substitution for P[a,b] and eq64 into eq60

We commence with eqs61 and 64

```
> eq[60] : T(%);
```

$$P_{a\,b}\,\omega^{b\;\;d}{}_{;d} = -\frac{2\,p'\,\theta\,\omega_{\,a}}{\Psi} - \frac{\Psi^{\;;d}\,\omega_{a\,d}}{\Psi} \tag{1.2}$$

```
> eq[64] : T(%);
```

$$\omega^{a\;\;b}\,\Psi_{\;;b} = 0 \tag{1.3}$$

```
> temp := subs(a =-a, b =-d, B =-D, eq[64]) : T(%);
```

$$\omega_{a\,d}\,\Psi^{\;;d} = 0 \tag{1.4}$$

```
> temp2 := TEDS(temp, eq[60]) : T(%);
```

$$P_{a\,b}\,\omega^{b\;\;d}{}_{;d} = -\frac{2\,p'\,\theta\,\omega_{\,a}}{\Psi} \tag{1.5}$$

```
> temp5 := convert(temp2, string) : T(%)
```

"P[-a,-b]*omega[b,d,-D] = -2*`p'`*theta*omega[-a]/Psi" **(1.6)**

```
> eq[67] := parse("P[-a,-b]*omega[b,d,-D] = -2/psi^2*Psi*p*`'`*theta*omega[-a]") : T(%);
```

$$P_{a\,b}\,\omega^{b\;\;d}{}_{;d} = -\frac{2\,\Psi\,p'\,\theta\,\omega_{\,a}}{\psi^{2}} \tag{1.7}$$

```
>
```

which is eq66