Dark-energy dependent test of general relativity at cosmological scales.

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Yves Zolnierowski (LAPP) & AB
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This does not result from a pure geometrical test on our 3D space.

(very) Basics of cosmology...

Robertson-Walker metric

$$ds^2 = -c^2 dt^2 + a(t)^2 [r^2 (d\theta^2 + \sin^2 \theta d\phi^2) + \frac{dr^2}{1 - kr^2}]$$

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and :

General Mattig relation

$$r = S_k \left(\int_{t_S}^{t_0} \frac{cdt}{a(t)} \right)$$

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General Relativity

$$K = c^2$$

so

$$\Omega_k = 1 - \sum \Omega_{contents}$$

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$$\Omega_{kgeo} = -\frac{k}{(a_0 H_0)^2}$$

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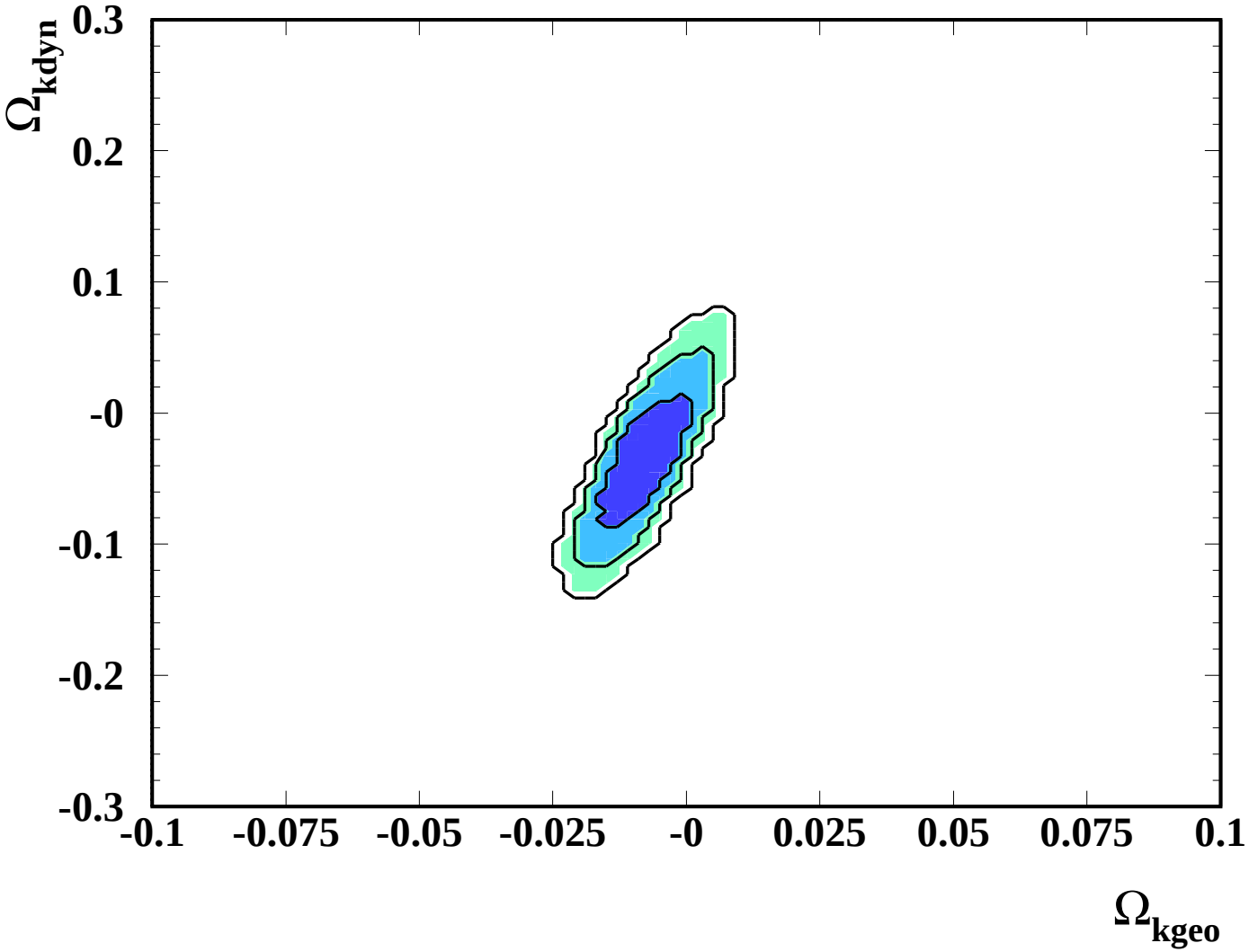
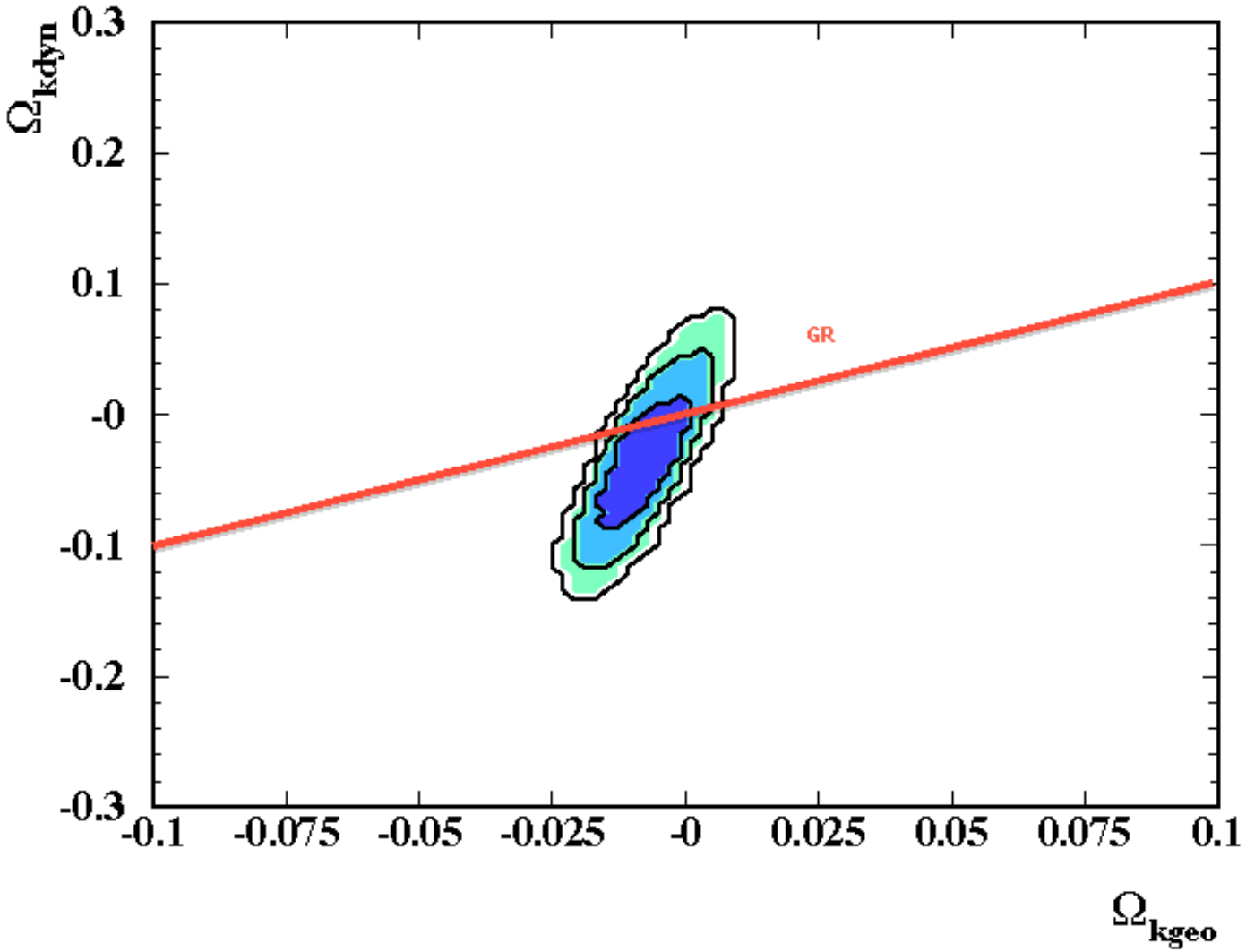
and use SNIa, CMB, BAO to constrain these quantities.

With $w = -1$


Ω_{kdyn}
0.3
0.2
0.1
-0
-0.1
-0.2
-0.3
-0.1
-0.075
-0.05
-0.025
-0
0.025
0.05
0.075
0.1
Ω_{kgeo}

With $w = -1$


Ω_{kdyn}
0.3
0.2
0.1
-0
-0.1
-0.2
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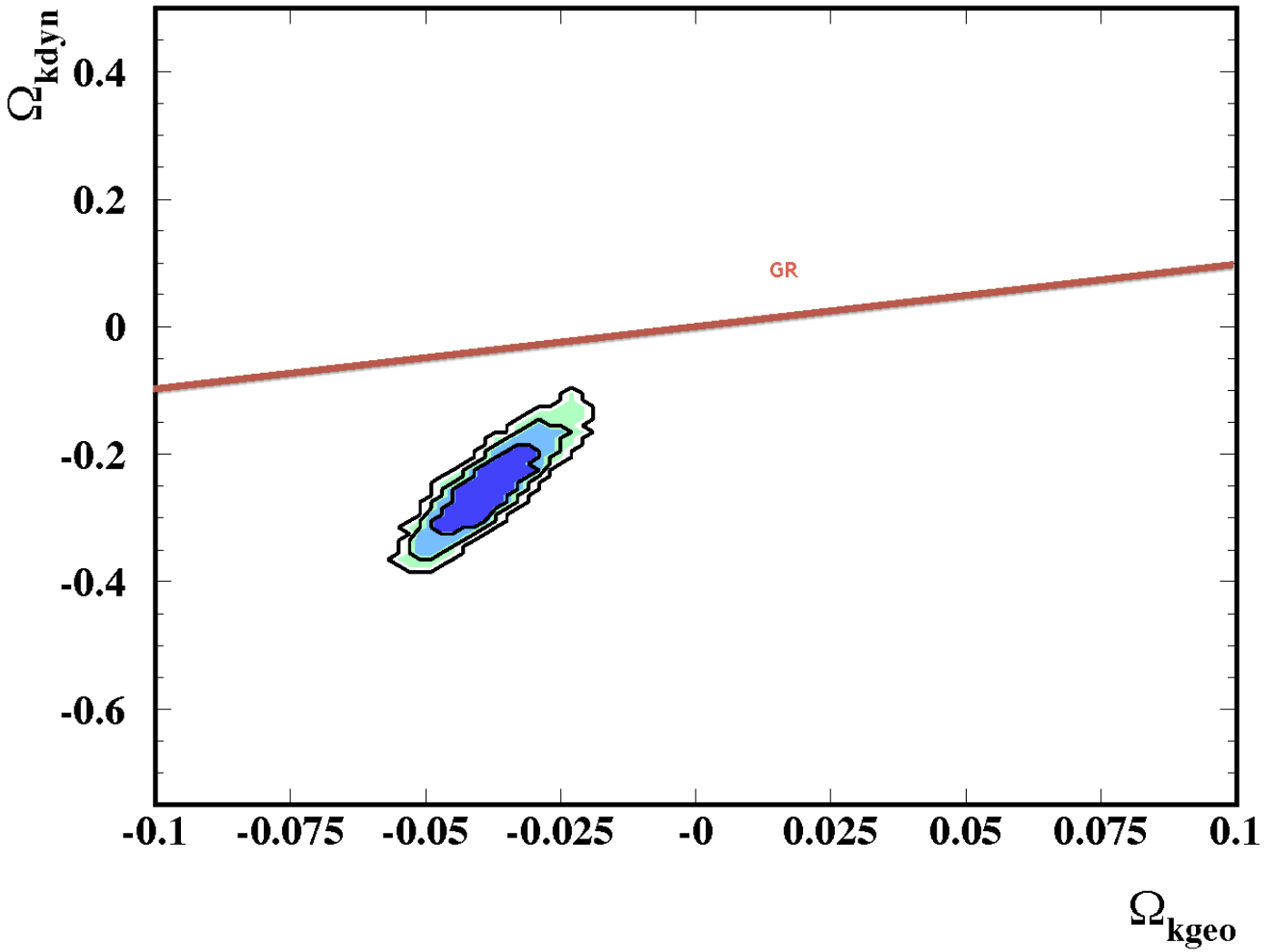
GR
-0.1
-0.075
-0.05
-0.025
-0
0.025
0.05
0.075
0.1
Ω_{kgeo}

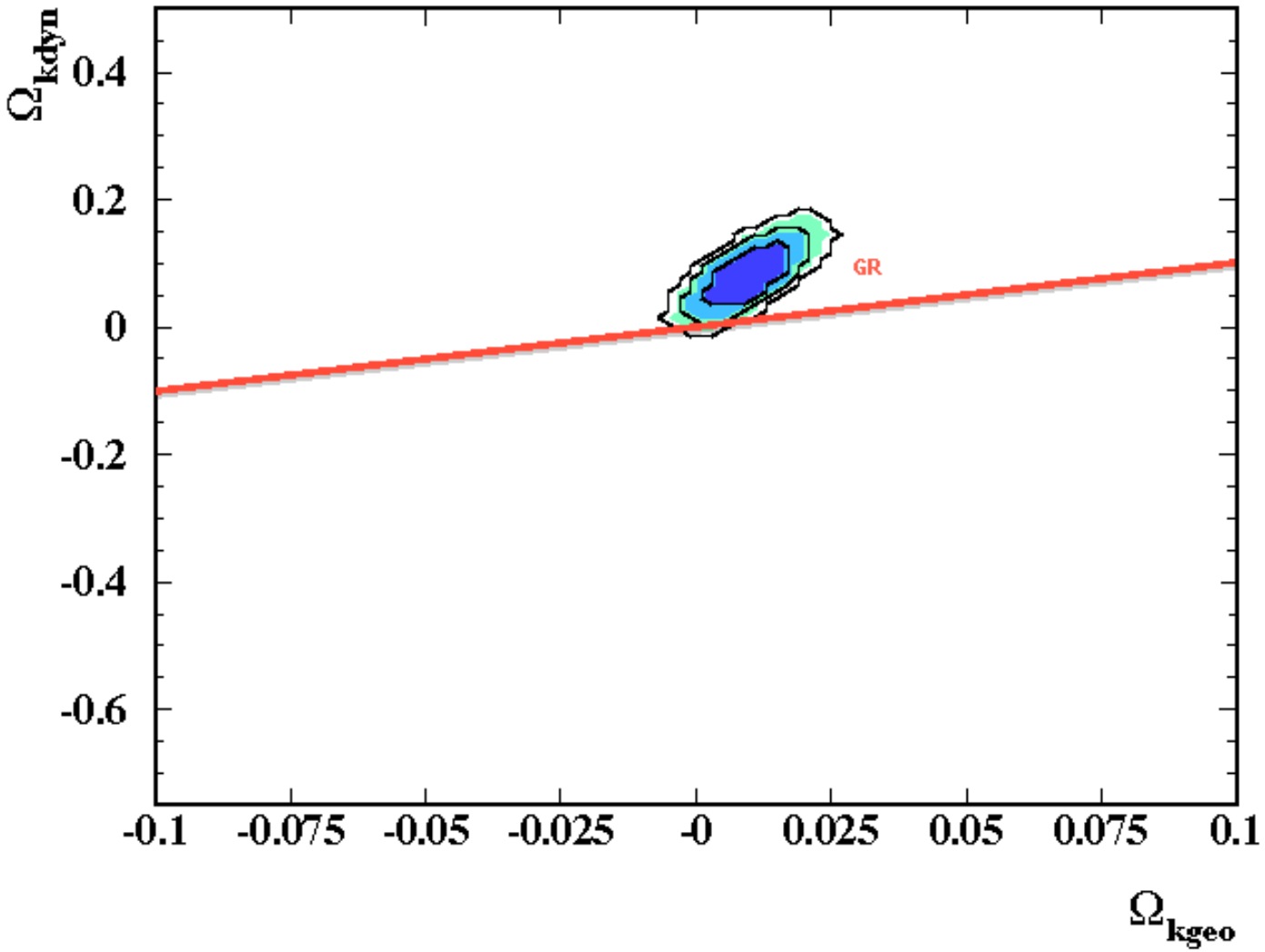
With different equation of state

w = -0.8



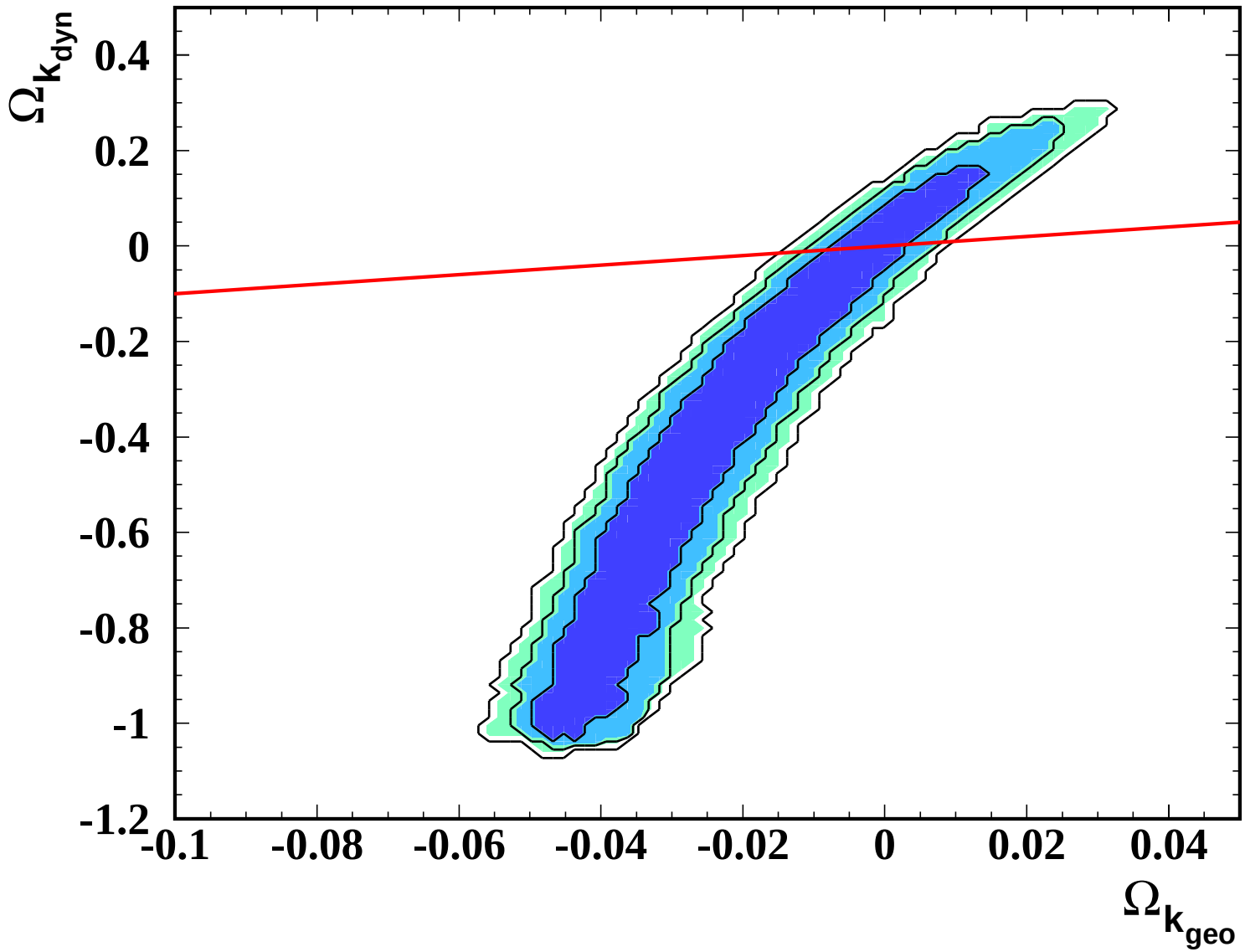
With different equation of state

w = -1.2



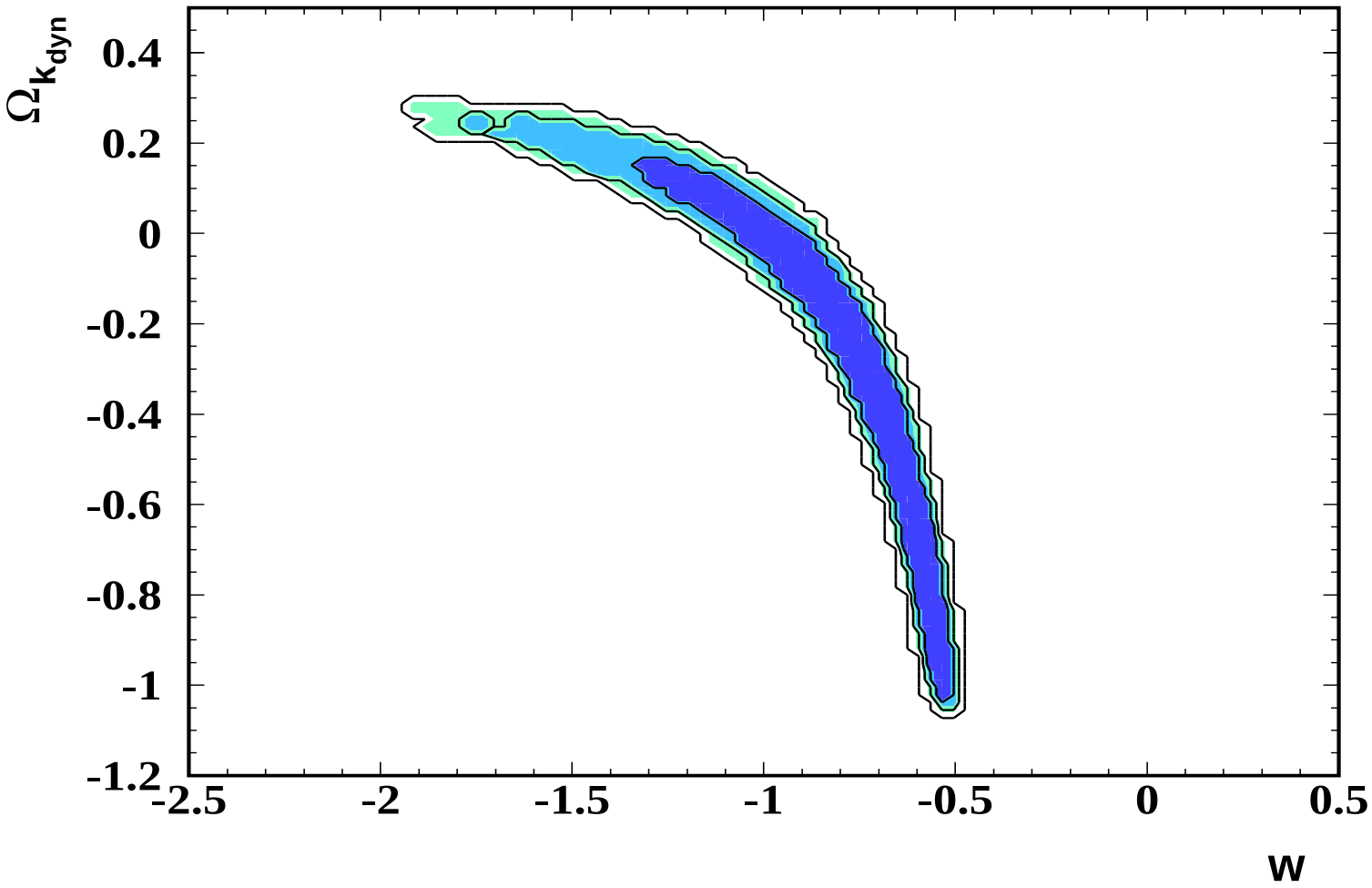
With different equation of state

w = marginalized



With different equation of state

Nice degeneracy...



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Thank You