Erratum to: Gravitational waves from colliding vacuum bubbles in gauge theories

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In this Erratum we correct the numerical results of the thin-wall simulations given in the article.

As shown in the article, the abundance of GWs produced in bubble collisions in a logarithmic frequency interval can be written as

$$\Omega_{\text{GW}}(\omega) \equiv \frac{1}{E_{\text{tot}}} \frac{dE}{d \ln \omega} = \left(\frac{H}{\beta} \right)^2 \left(\frac{\alpha}{1 + \alpha} \right)^2 S(\omega), \quad (1)$$

We calculate S by performing thin-wall simulations where we nucleate bubbles according to the rate $\Gamma \propto e^{\beta t}$ in a cubic box of size $(7/\beta)^3$ with periodic boundary conditions. We perform the angular integrals over the bubble surfaces by discretising each of them with 10^6 evenly distributed points. Our results are calculated from 60 simulations. In the same way as in the article, we parametrize the results as a broken power-law,

$$S_{\text{fit}}(\omega) = \frac{\bar{S} (a + b)^c}{\left[b \left(\frac{\omega}{\bar{\omega}} \right)^{-a/c} + a \left(\frac{\omega}{\bar{\omega}} \right)^{b/c} \right]^c}, \quad (2)$$

where $\bar{S}$ and $\bar{\omega}$ are the peak amplitude and angular frequency of the spectrum, $a, b > 0$ are the low- and high-frequency slopes of the spectrum respectively, and c determines the width of the peak. We show the parameter values and their errors resulting from fits to our simulation results in Table 1 for $\xi = 2, 3, 4$ and the envelope approximation and illustrate these fits in Fig. 1. In the article, the table and the corre-

Table 1 Fitted values for the parametrization of the spectral shape (2)

	$100\bar{S}$	$\bar{\omega}/\beta$	a	b	c
$\xi = 2$	4.23 ± 0.1	0.68 ± 0.01	1.00 ± 0.02	2.17 ± 0.05	2.02 ± 0.1
$\xi = 3$	3.61 ± 0.1	0.82 ± 0.01	2.34 ± 0.03	2.41 ± 0.02	4.20 ± 0.2
$\xi = 4$	3.46 ± 0.1	0.93 ± 0.01	2.87 ± 0.04	2.42 ± 0.02	4.63 ± 0.2
env.	2.75 ± 0.1	1.72 ± 0.04	2.98 ± 0.02	1.01 ± 0.02	2.18 ± 0.1

Fig. 1 The spectral shape of GWs (see Eq. (1)) from vacuum bubble collisions. The curves show broken power-law fits to the simulation results for different decay-laws of the GW source after collisions and in the envelope approximation. The solid curve is realised in the case of breaking of a gauge U(1) symmetry. The corresponding parameters of the fit, and their errors, are given in Table 1

sponding plot are wrong due to a small error in the numerical simulation.

The original article can be found online at <https://doi.org/10.1140/epjc/s10052-021-09232-3>.

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