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OPTIMIZATION OF VISUAL EFFECTS MODELING BY TRAPCODE MIR PLAGINS

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The using of modern Trapcode Mir plagin is considered for creations of visual effects of same physical phenomena, which are based on plane modeling by animations of fractal map. The set of presets are worked out, that considerably make faster process of the visual effects modeling.

Key words: visual effects, presets, animations of fractal map, amplitude of fractal displacement.

Formulation of the problem. In our time, computer graphics play an important role in the digital provision of modern society. This tool allows not only to create a detailed visualization of engineering developments or demonstration of research results, but is also widely used in advertising on TV and the Internet, the creation of "digital scenarios" for concerts, presentations, titles in motion pictures, television channels, which plays an extremely important role in simulation of visual effects (pipeline). To the process of developing visual effects, 2D and 3D animations, especially if there is a simulation of liquids, vapors, and particle interactions in various physical phenomena in the scenes, there are several different software tools that are not always a convenient solution. However, there is a gradual increase in the number of studios that implement the visual effects and animation approach, preferably by means of one software product intended for compositing (for example, Adobe After Effects). A promising and effective approach is precisely to translate most of the process into a compositing program [1]. Already today in Ukraine there are technologies that allow to create visual effects at the level of world standards. Stop only budgets [2]. Therefore, it is necessary to find algorithms for simulation that accelerate time and at the same time prove to be cost-effective.

Analysis of recent research and publications. When creating visual effects of physical phenomena (dust, smoke, fire, rain and similar phenomena), dynamic simulation of particle systems is used. Adobe After Effects contains standard effects that allow working with particle systems, such as SS Particle World, CC Particle Systems II [3]. But these effects are limited in settings and when trying to simulate something more difficult than a fireworks are considered very slowly, because their calculations are carried out through the CPU of the computer.

In [4], the Trapcode Particular plugin was used, which has a sufficiently large number of settings required for working with particle

systems. In addition, all calculations are carried out using a computer graphics card, which has a positive effect on speed. Using this plugin, the behavior of computerized dust and fire was modeled. The end result was saved as a preset effect.

Formulating the goals of the article. The purpose of our study is to create visual effects of physical phenomena using the Trapcode Mir plugin without the use of dynamic particle simulation, and with the help of animation of a fractal map of the distorted plane that will significantly accelerate the simulation process.

Main part. When simulating visual effects for a fast result, it is not always advisable to use the Trapcode Particular plugin. To simulate gases and dust, especially with a large number of particles (meaning scenes from more than three Particular layers generating more than 200 particles per second each), the task will become quite difficult for computing. An example of this scene is depicted in Fig. 1.

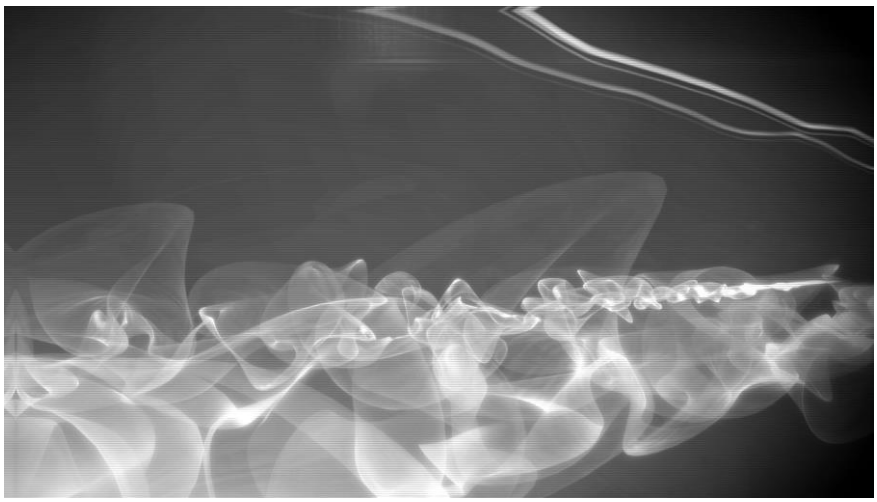

Fig.1 Computerized dust modeled with a large amount of generated particles

The solution of the optimization problem could be realized in two directions. The first one is to create a prerender for each emitter (source of particle generation), that is, a renderer in separate parts, and then substitution in the final composition. The disadvantage of this method is a little flexibility, because in order to make changes to the final composition, it is necessary to fix everything in a separate composition, which then needs to be sent back to the render again.

The second is to search for a less resource-solving solution. Fortunately, the Trapcode plugin series includes plugins that allow you to get similar results. One of them, which became an alternative to Trapcode Particular, is to solve our problem Trapcode Mir. Trapcode Mir does not create particle systems, but creates 3D shapes based on polygonal meshes,

and also allows you to model smoothness of abstract structures and natural elements. And the realization of calculations is carried out with the help of a video processor.

With this plugin, various distortions of the simulated surface were created. Unlike Particular, in the settings, there is no Physics group, and the defining group of parameters of this plug-in for solving our problem is Fractal. To get the final result, the animation keys were added to the "Offset" parameter, which corresponds to the displacement of the fractal map (Fig. 2), according to which, in turn, the distortion of the plane and the amplitude of the fractal displacement (Amplitude) will occur.

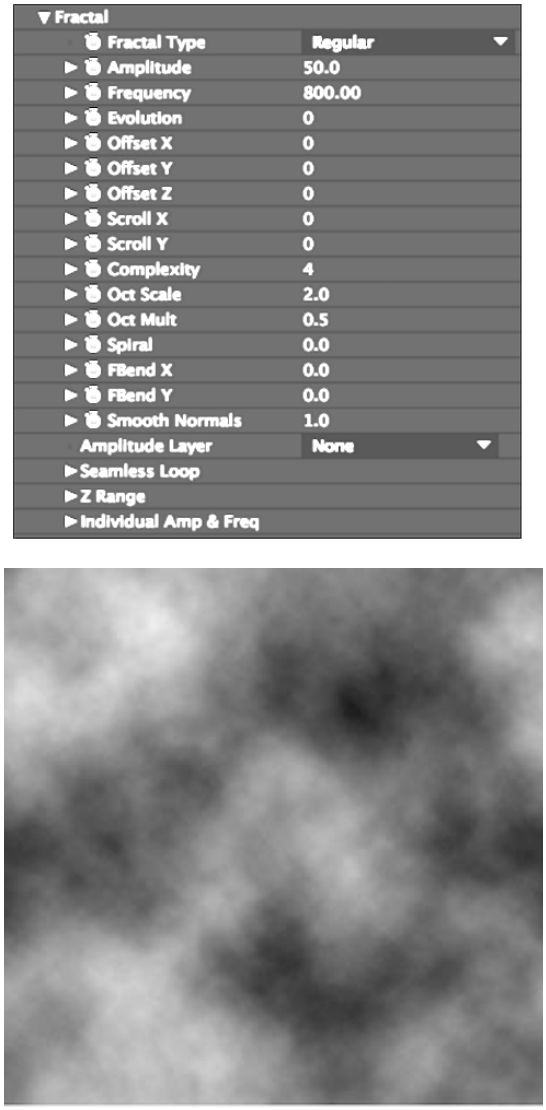

Fig.2 The Fractal parameter group is a Trapcode Mir plugin that defines the behavior of surface distortion

On this basis, a number of presets for the Trapcode Mir plugin were developed, some of them are depicted in Fig. 3:

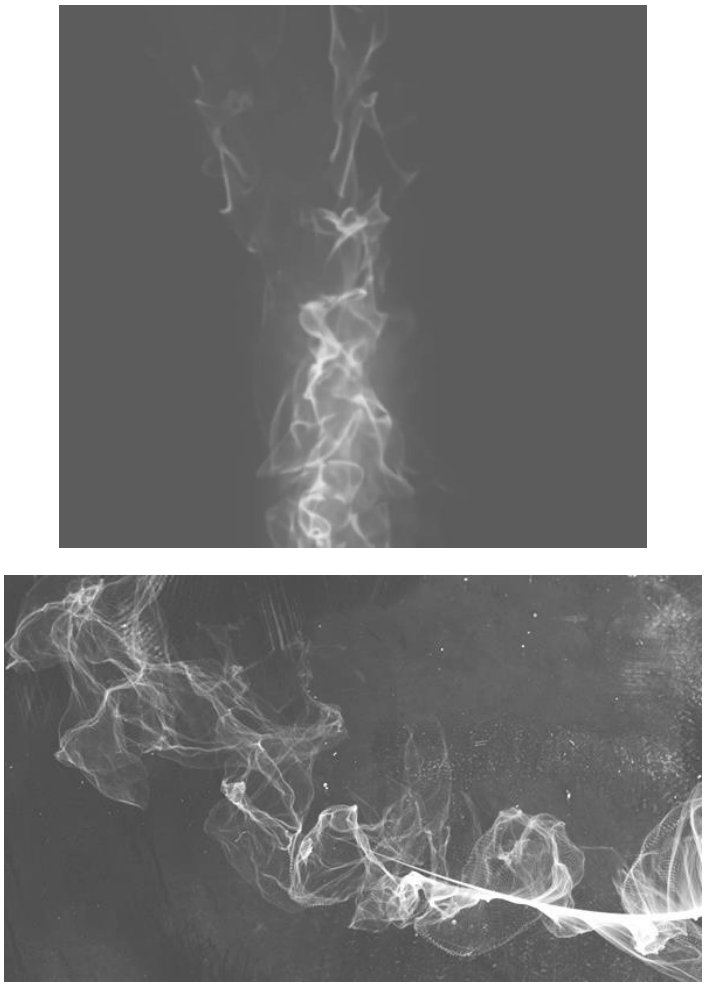

Fig. 3 Developed presets for the Trapcode Mir plugin

It should be noted that the settings are not too obvious to the regular user After Effects, since these presets are based not on simulation of real physical conditions, but on imitation of distorted geometry editing tools, therefore the following parameters are passed to the control layer of this preset:

– amplitude of fractal displacement;
– surface dimensions;
– type of offset map;
– the position of the whole effect;
– degree of twisting.

Conclusions. As a result of the experiments, visual effects of computerized dust and smoke are simulated based on imitation of distorted geometry editing tools, which can significantly accelerate the simulation process, as well as developed presets for the Trapcode Mir plugin.

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ОПТИМИЗАЦИЯ МОДЕЛИРОВАНИЯ ВИЗУАЛЬНЫХ ЭФФЕКТОВ СРЕДСТВАМИ ПЛАГИНА TRAPCODE MIR

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Рассматривается применение современного плагина Trapcode Mir для создания визуальных эффектов некоторых физических явлений на основе искажения плоскости методом анимации фрактальной карты, разработано набор пресетов, которые значительно ускоряют роботу моделирования визуальных эффектов.

Ключевые слова: визуальные эффекты, пресети, анимация фрактальной карты, амплитуда фрактального смещения.

ОПТИМІЗАЦІЯ МОДЕЛЮВАННЯ ВІЗУАЛЬНИХ ЕФЕКТІВ ЗАСОБАМИ ПЛАГІНУ TRAPCODE MIR

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Розглянуто використання сучасного плагіну Trapcode Mir для створення візуальних ефектів деяких фізичних явищ на основі спотворення площини шляхом анімації фрактальної карти, розроблено набір пресетів, що значно прискорює роботу з моделювання візуальних ефектів

Ключові слова: візуальні ефекти, пресети, анімація фрактальної карти, амплітуда фрактального зміщення