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4K: what are the implications for the satellite sector?

It's undeniable that 2016 is seeing a lot of action in the 4K field. Although 4K TVs became available to consumers in 2013, encoding technology has progressed significantly since then, rendering most 4K TVs from 2013 and many from 2014 obsolete. With the roll-out of 4K content from studios finally picking up pace, the effects will be evident on almost any device with a screen; TVs, cameras, phones, tablets, and PC monitors. Satellite Evolution takes a look at the latest developments in 4K and what the implications are for the satellite sector.

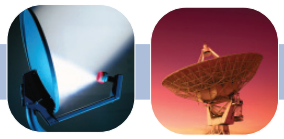
4K (also known as Ultra HD or Ultra High Definition) is a screen resolution that quadruples the number of pixels in a standard HD picture from 1920x1080 to 3840x2160. While the term '4K' was originally used to describe the 4096x2160 resolution found in digital cinema, it is now used interchangeably between cinema and TV. Some have argued that 4K is an unnecessary advancement, as the viewer must sit within 2m of the screen in order to perceive the enhanced picture quality. In addition, TV displays need to be at least 55 inches for good results, too large for many modern homes. Despite this, as with the majority of technological advancements, 4K is being embraced by industry and consumers alike as we become more discerning in our consumption habits.

To ensure full compatibility between content and devices, the UHD Alliance, a consortium of 35 companies including Netflix, Panasonic and Samsung, recently implemented agreed 4K standards, in addition to a logo that will certify compliant 4K TVs as 'Ultra HD Premium.' With strict minimum specifications for resolution (3840x2160 pixels), colour (90 percent of P3 colours) and bit depth (10-bit signal), among others, the new standards will help to accelerate global 4K adoption.

Mixed views on the 4K market

Back in September 2014, many were sceptical about whether 4K would gain global relevance or whether, like 3D, it would go down as a damp squib. Intelsat said at the time that 4K would be mainstream within ten years. During a survey of media executives, Intelsat found that 42 percent of respondents planned to invest in a 4K TV service, 23% in the next four years.

"While it is becoming more evident that the transition to 4K UHDTV is highly likely, the road to adoption will take many paths, given the business model evolution resulting from the multi-screen viewing environment," said Peter Ostapiuk, Vice President, Media Product Management, Intelsat. "As with HD television, socio-economics, demographics and technology



infrastructure will determine the adoption timeline. This time, however, media companies are more focused on building the right business model that will enable them to deliver high quality and reliable content delivery across multiple platforms and, at the same time, achieve a strong return on their investment."

A critical mass of content (38 percent), sufficient household penetration (35 percent) and available 4K TV-enabled set top boxes (STB) (31 percent) were deemed important factors in accelerating the roll-out of 4K TV. Films and sports were the most widely identified types of 4K TV content expected to gain momentum first, at 53 percent and 42 percent, respectively.

"Satellite will positively impact the adoption of this new and exciting technology and serve as a strategic partner to media customers," said Ostapiuk. "It's clear that our customers will introduce 4K TV as a way to distinguish their brands, and the ubiquitous and extremely high quality of satellite will deliver an immersive experience with cost efficiency. With the ability to easily handle transmission of multiple viewing formats across a hybrid distribution infrastructure, Intelsat is prepared to support this emerging growth opportunity for our global media customers."

Industry analyst IHS forecast that, by the end of 2017, most 50 inch and larger TVs will feature 4K resolution. 4K TVs are expected to exist in 34 percent of households in the USA and 25 percent of homes in the European Union (EU). The rise in 4K adoption in the west is expected to stem from the roll-out of 4K content both online and from paid-for TV.

Household penetration in Japan will to be relatively low at 14 percent, as most TVs currently owned there are relatively new, purchased due to the nationwide abandonment of analogue broadcasting in 2011. Hisakazu Torii, Senior Director of Consumer Device Research for IHS Technology, said that there was another reason 4K TVs won't be catching on in Japanese houses yet: "With the Japanese consumer preference for smaller TV screens, it will be more difficult for 4K TV to expand its household penetration in the country, even though UHD broadcasts are set to begin in 2018, in the run up to the Tokyo Olympic Games in 2020." 4K TVs are expected to be present in 24 percent of Chinese homes by 2019, in contrast with other major developing countries like Russia (11 percent), Brazil (8 percent) and India (2 percent).

Meanwhile, in March 2016, Northern Sky Research (NSR) asserted that there would be exponential growth of 4K content and channels through DTH, Cable TV and IPTV platforms in the wake of the '2016 Inflection Point.' NSR expects more than 785 new 4K channels to be available by 2025 and associated satellite capacity leases to grow to US$280m/yr.

Lack of 4K content hinders uptake

Considering that 4K TVs have been available since 2013,

uptake by producers has been slow. Indeed, there are huge investments to be made in terms of hardware. New cameras, storage and mastering systems don't come cheap, while some film studios are still looking for ways to make 4K films financially viable. Others, having only recently upgraded to HD, may well wait for the roll-out of 8K. Producers have also been reluctant to start making 4K content as 4K TV prices remained high, thus limiting consumption. However, this is set to change in 2016, as 4K TVs have become much more affordable.

Netflix was the first major company to start providing 4K content with blockbuster TV series like 'Breaking Bad' and 'House of Cards,' followed closely by Amazon Prime Instant Video and Vudu. However, the monthly subscription cost for Netflix increases from US$8.6 for standard to $13 for 4K. The company does not publish a breakdown of its subscriber numbers by subscription type, so it's impossible to see how popular Netflix 4K has been so far.

In April 2016, Sony launched its new 4K streaming service, Ultra, although content is currently only accessible via an app that is available exclusively on Sony-brand TVs. Unlike Netflix's subscription-based service, Sony's 4K consumers will have to purchase individual films for around US$30 each.

The first 4K Blu-ray player was released in Japan in November 2015 by Panasonic, with 4K Blu-ray players by Panasonic and other companies expected to be released in the rest of the world in 2016. To accompany the new devices, Sony recently released a collection of re-mastered Blu-ray films, converted from HD to 4K to have a wider colour range and enhanced picture quality. True 4K content on disc has not hit the market just yet, but again, this is expected very soon.

According to industry rumours and insiders at the Wall Street Journal, Sony is developing what has been dubbed the 4K PlayStation or PlayStation 4.5, a 4K-enabled games console that will likely be produced alongside its standard PlayStation 4. This is the first report of 4K games console, excluding PCs and laptops, of which numerous models already exist. An official announcement from Sony is expected around October 2016.

In contrast with the limited subscription and disc content, there are a significant number of free and paid-for satellite TV channels currently broadcasting 4K, although content is limited. Lifestyle, documentary and sports are all comparably well-covered, while popular TV shows and news channels lag behind. BT has its BT Sport Ultra HD channel, while Sky's new Sky Q STB will distribute 4K content later in 2016; not in time for the Premier League, but the company has announced that it will distribute 4K Formula 1 racing content from 2017. AsiaSat recently launched its first 4K channel, which will feature a mixture of fashion, documentary and lifestyle shows. Meanwhile, DIRECTV, now part of AT&T, has launched its new 4K TV channel, which in April 2016 broadcast the USA's first live 4K content from the Masters Golf Tournament.

4K in the satellite sector

One of the key hurdles to 4K going mainstream is the speed required to stream it via the Internet. Netflix estimates that 3Mbps are required to stream SD content, 5Mbps is needed for HD and 25Mbps for 4K, although new codecs like high efficiency video coding (HEVC) have enabled HD streaming at 2.5Mbps and 4K at 15Mbps. However, 15Mbps is still a long way out of reach for much of the world.

This is obviously not a problem to the satellite sector, and is one of the reasons that, initially at least, 4K is likely to be bigger in the satellite industry than the streamed video-on-demand (VoD) sector. A large number of satellite operators already have multiple 4K TV broadcasts, giving them a lead on Internet streaming companies. Being able to literally access customers that are out of reach of Netflix et al may well provide a boost to the market share of satellite broadcast operators.

SES was one of the first satellite operators to seize the new 4K technology. The company broadcasts 19 x 4K channels from three of its satellites: ASTRA 19.2° E, ASTRA 28.2° E and ASTRA 5° E. Current channels include Pearl TV, the first commercial free 4K channel in Europe, and NASA UHD TV, the first non-commercial 4K channel in North America.

Eutelsat also broadcasts permanent 4K TV channels from two of its satellites. HOT BIRD 4K1 uses HEVC encoding and broadcasts at 50fps to Europe, the Middle East and North Africa; it was Europe's first 4K broadcast channel to comply with this standard. Meanwhile, the Eutelsat 5 West A satellite has launched FRANSAT Ultra HD, a demo TV channel for French viewers. The company also works with broadcasters to distribute live events in 4K to TV studios, cinemas or DTH.

Eutelsat also participated in the first global 4K broadcast via satellite in December 2015. The ceremony of the opening of the Holy Door at the Vatican, which marked the start of the

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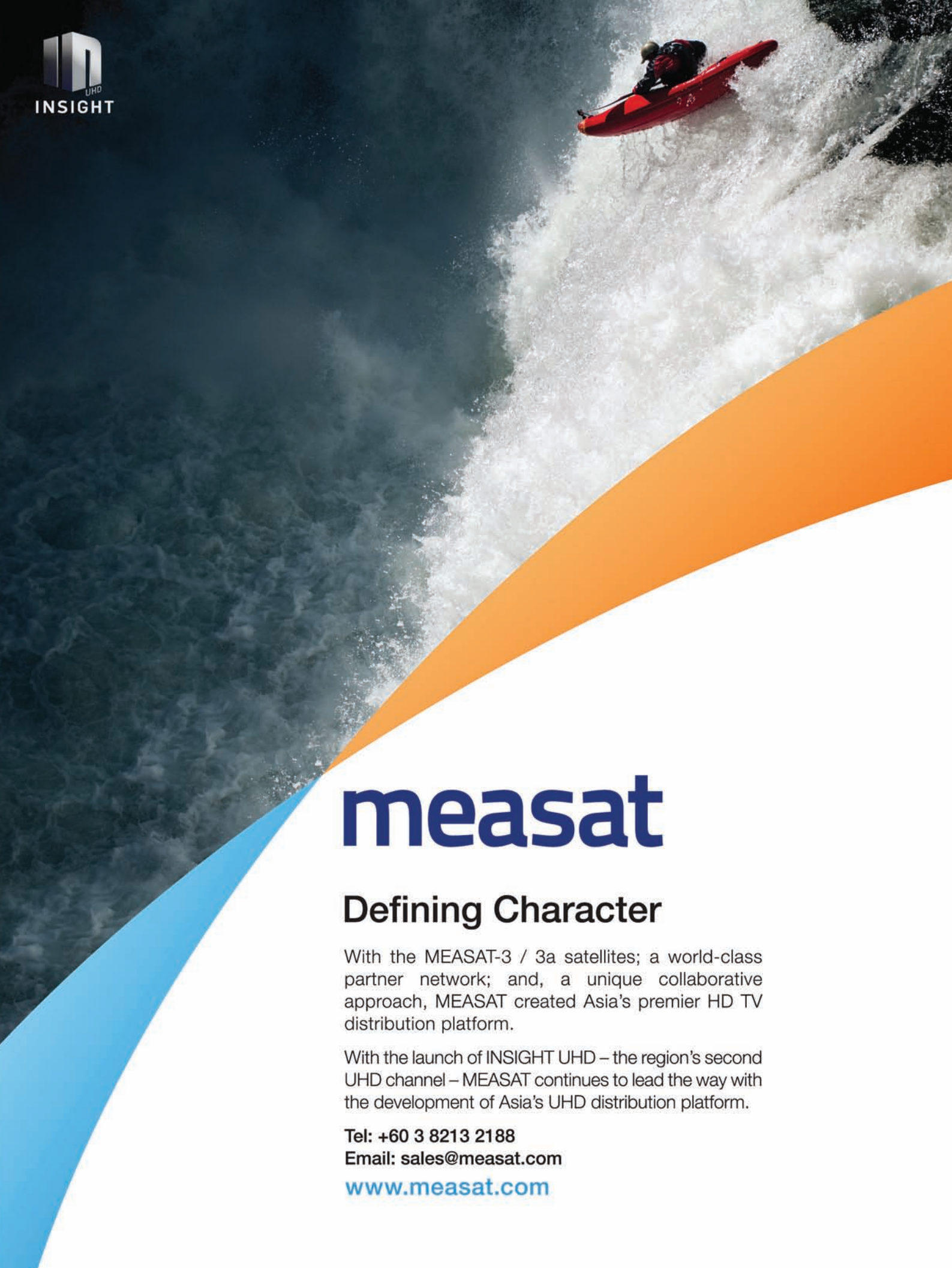

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Jubilee Year of Mercy, was broadcast to two large screens in the Paul IV Atrium in the Vatican, as well as DTH using HOT BIRD 4K1 and Eutelsat 5 West A. The event was produced by the Vatican Television Centre with support from Eutelsat, Sony, Globecast and DBW Communication.

So, what's next?

Unlike 3D, which hovered in the peripheral of everyone's vision for a few years before being largely denounced by consumers (much to the dismay of cinemas everywhere), 4K is concluded by those in the know to be the future of TV, the next logical step to HD. Satellite operators will be the biggest initial beneficiaries, given that their reach is truly global and they are unhampered by slow broadband speeds. For the first time in a long while, satellite will have an edge over Internet-streaming among early adopters and technology enthusiasts.

According to the SES website, "Satellite will inevitably play a part (in 4K TV) because it is so well suited to live high definition content that reaches millions of households. Satellite broadcasting is the ideal way to provide Ultra HD, as it delivers sufficient bandwidth to all the DTH, cable and IP TV homes it serves... SES was at the heart of the development of HD in Europe and Ultra HD is the next opportunity to make a tremendous difference to the landscape of broadcasting."

But is 4K the end-game, or is it just the start? According to IHS, the advent of 8K broadcasting in Japan for the 2020 Olympics is expected to prompt the start of adoption of 8K (7680x4320 pixels) TVs. Global shipping numbers of 8K TVs are expected to grow from 2,700 in 2015 to 911,000 in 2019. Some 80 percent of 8K TVs are expected to have 65 inch screens.

"The biggest inhibitor to the growth of 8K TV will be consumer screen size preferences," said Paul Gray, Principal analyst for IHS. "8K requires a very large screen or the higher resolution becomes invisible at normal viewing distances. The average screen size in the TV market has grown by an inch each year over the past decade, but it is still a long haul before sizes over 70 inches become commonplace." New production capacity in China scheduled to come online in the next three years will likely see production rates of 65 inch 8K TVs grow significantly. "We can be confident that a combination of enhanced local panel production and consumer's eager for the latest technology will make China the driving factor in 8K television growth," said Gray. ■

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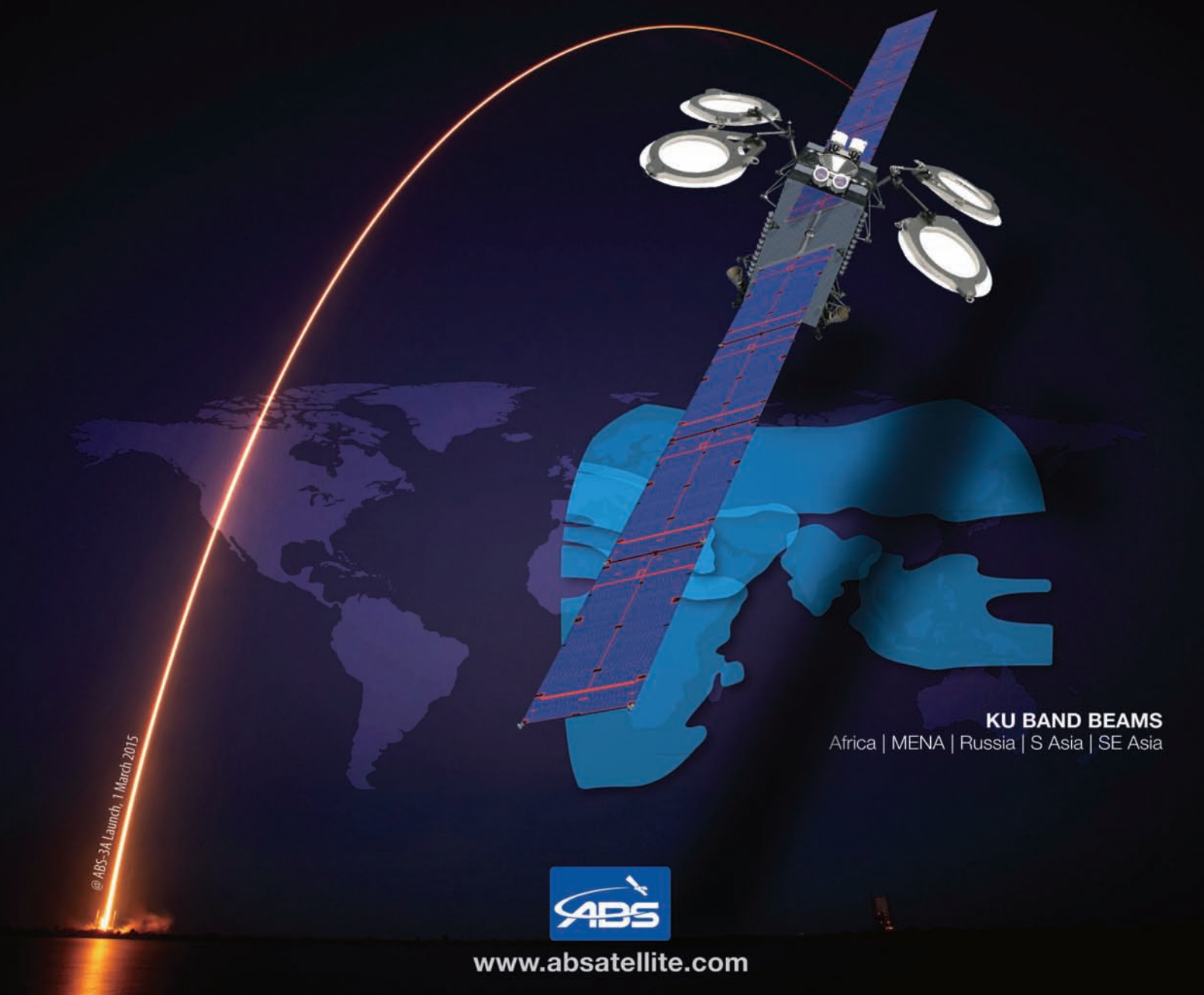

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